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ON THE OCCURRENCE OF EVERSMAUN'S
WARBLER (*PHYLLOSCOPUS BOREALIS*
(BLASIUS)) AT FAIR ISLE: AN ADDITION
TO THE BRITISH FAUNA.

By WM. EAGLE CLARKE, F.R.S.E., F.L.S.

ON the 28th of September last, while in search of migratory birds at Fair Isle, I put up from a patch of potatoes, where it was hiding, a dark-coloured Willow Warbler, which I at once suspected belonged to some species I had never before seen in life. I was fortunate enough to secure the bird, and congratulated myself, as I contemplated its outstretched wings each with a conspicuous *single* bar and its well-defined, pale, superciliary stripe, on the capture of the third British example of the Greenish Willow Warbler (*Ph. viridanus*).

On my return to Edinburgh, however, I was agreeably surprised to find that my bird was undoubtedly an example of Eversmann's Warbler (*Ph. borealis*)—a bird which had not hitherto been detected in Britain. The descriptions of this species are misleading, far too much importance being made of the so-called double wing-bar. The second bar is absent in some examples, while in others it is only present in the shape of a few flecks of greyish-white on the tips of

the median wing coverts. A much safer guide is to be found in the wing formula. In this species the second primary quill is intermediate in length between the fifth and sixth, the third and fourth are equal and are the longest, the fifth is much shorter, and the sixth is considerably shorter than the fifth. In all these respects the Fair Isle specimen, which is a male, agrees with the descriptions, and the wing measures 2.55 inches.

In colour the upper surface is darker than that of our familiar Willow Warbler (*P. trochilus*), being dusky greyish-green; the eye-stripe is well defined, extends on to the nape, and is yellowish-white; the greater wing coverts are broadly tipped with greyish-white, forming a conspicuous wing-bar; the cheeks whitish, dappled with grey; the under surface whitish, greyer on the breast and flanks, and faintly washed with greenish-yellow.

On examination, the contents of the gizzard were found to consist of a Phalangid, two Noctuid larvæ, and the remains of *Scatophaga stercoraria* and *Anthomyia phorbia* and many fragments of other Dipterous insects.

This species has only once before, I believe, been obtained in Western Europe, namely, at Heligoland on the 6th of October 1854. This is, perhaps, somewhat remarkable, since the bird occurs in summer in Finmark and Northern Russia. It also summers throughout Siberia, and has been obtained in Alaska, where it is known to American ornithologists as Kennicott's Willow Warbler. In winter it occurs in Burma, the Malay Peninsula, the Andaman Islands, China, Formosa, Borneo, etc. It would be extremely interesting to know where the European contingent pass the cold season, for it is difficult to believe that there are no winter retreats for the species nearer than the eastern section of Southern Asia.

Eversmann's Warbler frequents woods composed of deciduous trees in elevated districts, especially those in the vicinity of water. Its food consists of insects, which it seeks high up among the foliage. The nest is described as being a semi-domed structure of moss and dry grass, placed on the ground, and lined with fine grass. The eggs are five or six in number, rather larger than those of the Willow Warbler, and are white abundantly spotted with pink.

SOME AUTUMN BIRD NOTES FROM THE
OUTER HEBRIDES.

By the DUCHESS OF BEDFORD.

AS comparatively few Ornithologists visit the Outer Hebrides in the month of November for bird-watching, the following notes, made in Barra and South Uist between the 31st October and 8th November, may be of interest. Fortunately, Barra boasts of resident observers who have kept a very careful record of the birds for many years, but, as migrants often spend but a day or two in passing, it is not possible even for residents to note more than a small proportion of their interesting visitors.

At this time of year every day brings something worthy of note, whether it be the arrival of regular winter visitors, of rare stragglers, or the exceptionally late appearance of summer migrants (on passage from Northern Europe), which are generally supposed to have left the British Islands several weeks earlier. Amongst these last were three Wheatears, seen on the 1st November, and a Chiff-chaff on the 7th. Probably a great many of the Chaffinches, Hedge Sparrows, Greenfinches, and Golden-crested Wrens that were there in the beginning of the month were also migrating. The only thick bit of shrubbery that I know of on this island is a great attraction to these birds. When visiting it on 3rd November my attention was at once arrested by a little brown bird, which I at first took for a Warbler. Its strikingly large eye, buff breast, and some very conspicuous white about the tail puzzled me very much, as the bird was so restless that I could not see exactly where the white came. At last, however, it obligingly perched on a wire fence only the width of a narrow road from me, and I was able to see that with the exception of the dark centre feathers the basal half of the tail was white. I then recognized that it was either a female or a young male Red-breasted Flycatcher (*Muscicapa parva*).

The Geese arrived much later than usual. On the 31st

October I saw a single Bernacle Goose, and on 1st November three Brent Geese. These latter were so tame that I walked up within gunshot of them on the sands without disturbing them. On the 3rd November, for the first time, I noticed large flocks of Bernacle, Brent, and Grey-lag Geese, also a flock of thirteen Whooper Swans flying over. On a still day Barra Sound is seen to be teeming with bird-life. The Great Northern Diver is a common bird, and five or six may often be seen at one moment. The Slavonian Grebe is also by no means uncommon, and I have seen five in one morning round the rocks. I have counted over 300 Mergansers in one small bay. The Eider Ducks and Long-tailed Ducks are more select and go about in smaller parties, but they are scattered in every direction. There are a few Black Guillemots and an abundance of Gulls; amongst the latter, however, the Lesser Black-backed is conspicuous by its absence. Manx Shearwaters and Arctic Skuas are scarce, but an occasional one may be seen near the open sea. Redwings and Fieldfares had arrived on the 3rd November, and on the same day I saw a flock of Bramblings, and on the 5th came upon a flock of Snow-Buntings on the Island of Fuday.

It is curious to watch the Seals following my Pekingese Spaniel along the shore for half a mile or more, even when he is on the sandhills above them and quite sixty to seventy yards from the sea. I have seen as many as sixteen collect and swim close to the shore in sight of him.

On an island near Tobermory, on my way to the Outer Hebrides, I saw a Stoat slip into the sea, without a moment's hesitation, as an Otter would take to the river, and swim over to another island.

Before leaving the Outer Hebrides I spent one morning on South Uist (6th November). There were very large flocks of Bernacle and White-fronted Geese on the western side of the island, and a considerable number of Whooper Swans on one of the lochs, also six Grey Plovers on the shore of the loch. Just before reaching the pier where my launch was waiting for me, I put up a Redstart. It sat on a wire fence close to me, and gave me ample opportunity of seeing from its size, uniform sooty-brown plumage, and red

tail, that it was a Black Redstart (*R. titys*). Not only was it larger than *R. phœnicurus*, but it struck me as being of slimmer build. The only other bird worthy of note seen on this occasion was the Hen-Harrier.

WOBURN ABBEY, WOBURN.

BIRD NOTES FROM THE ISLE OF MAY FOR THE YEAR 1908.

By EVELYN V. BAXTER.

THANKS to the observations made by Mr. Maccuish, I am able to supplement the account of my own work on the Isle of May with many interesting notes which he has sent me during the year. I arrived on the island on 10th September and stayed till 9th October. I was alone for the first fortnight, but my cousin, Miss Jackson of Swordale, was with me for the latter half of my visit. During my stay on the island I saw 83 species of birds, and Mr. Maccuish has sent me reports relating to 21 others, which bring the total up to 104 species observed on the May this year.

The first appearance of birds at the lantern in any numbers was on 10th February, when Thrushes, Redwings, Skylarks, and Starlings are reported. On the night of 7th March (N. wind, light) a "miniature rush" took place, and later in the month, on the 25th and 26th, great flocks of Fieldfares, Blackbirds, Thrushes, Rooks, Hooded Crows, and Jackdaws arrived on the island and remained for several days. Only small numbers of migrants are recorded till we come to 29th April, when a "great flock" of Fieldfares is noted, and the next night there were many Wheatears and Willow Warblers at the lantern. On 4th May there was a rush, when Wheatears, Willow Warblers, and Redstarts are noted as "swarming on the lantern from 11 P.M. till day-break on the 5th" (N.E.-E. light, fog), and next night the three species named above, as well as Fieldfares and Red-breasts, were numerous at the light. Throughout May, and until 2nd June, we have occasional records of migrants; and on 13th August the first of the autumn movement is

reported, two Wheatears being seen on that date. Redstarts, Redbreasts, Whitethroats, Willow and Sedge Warblers, Goldcrests, and Cuckoos followed in small numbers, but when I arrived on 10th September very few birds of passage were to be seen. For nine solid days thereafter the wind kept persistently in the N. and W., and with the exception of the Scarlet Grosbeak, my records were of a most disappointing description. However, on 19th September the wind at last went into the S.E. and I had a crowded week of glorious life; Redstarts, Pied Flycatchers, Whitethroats, Garden Warblers, Siskins, Whinchats, Chaffinches, and Bramblings came in, in numbers, and in lesser quantities were to be seen rarer migrants, as Bluethroats, Lesser White-throats, Blackcaps, Yellow-browed Warblers, Grasshopper Warblers, White Wagtails, and Wrynecks. The last fortnight of my stay was characterised by very light airs, mostly off the S. and S.W., and the stream of migration slackened very much though there were always some birds to be seen. In the end of October and beginning of November there were huge rushes at the lantern, chiefly Redwings; but there were also Fieldfares, Thrushes, Blackbirds, Wheatears, Robins, Blackcaps, Chiff-chaffs, Goldcrests, Siskins, Greenfinches, Bramblings, Chaffinches, Ring Ouzels, Starlings, Skylarks, Woodcock, Snipe, and Lapwings at the light. I wish to express my grateful thanks to the Commissioners of Northern Lights for their kindness in again permitting me to spend a month on the May, a time so full of interest and pleasure. I have also to thank Mr. Maccuish most heartily for supplying me with records and birds throughout the year, and both Mr. and Miss Maccuish for their great kindness and hospitality, which contributed so much towards making my stay so pleasant; also Mr. and Mrs. Ross, and all the other lighthouse officials, for allowing me to hunt their gardens for birds, and for their many other kindnesses; and Mr. Eagle Clarke for much valuable help and advice.

MISSEL THRUSH, *T. viscivorus*.—This is not a frequent visitor to the May. I have only four records for the year, viz. single birds on the 8th February and 23rd September, several on 7th October, when (contrary to what we had observed before on the island) they chiefly frequented the gardens, and two on 29th October.

SONG THRUSH, *T. musicus*.—Mr. Maccuish reports that a few stayed all winter. The first entry of Thrushes at the lantern is on 10th February, followed by a "miniature rush" on 7th March. On 21st March there were "many at the lantern"; flocks all day on the 25th; great numbers on 26th March, which stayed for several days; and on 1st April a few were at the lantern all night. When I arrived there were very few. On 20th September, however, a good many appeared, and they were numerous till the 22nd. The next two days there were only a few, but a fresh immigration took place on the 25th, and there were a good many till the 29th. Further rushes took place on 1st, 2nd, and 5th October, and they were still plentiful when I left on 9th October. Mr. Maccuish reports them as numerous all day on 16th October, and on the nights of the 17th, 23rd, 27th, and 28th they were at the lantern in small numbers.

REDWING, *T. iliacus*.—Some are reported at the lantern at 1 A.M. on the morning of 10th February. The first seen in autumn appeared on 2nd October, nearly a week later than the first-comers last year; on the 3rd one bird was observed, and there were a good many from 5th to 7th October. After I left Mr. Maccuish reports a great rush on 16th October, and on the 23rd from 2 A.M. till daylight (W. wind, light, hazy) "an enormous rush" followed, and another from 7 P.M. on the 23rd till daybreak on the 24th. On 27th, 28th, and 29th October there were large flocks at the lantern; from 6 P.M. on 3rd November till daylight on the 4th there were many at the light; and next night the rush was repeated. Mr. Maccuish says that this was the largest rush of one species he has ever seen.

FIELDFARE, *T. pilaris*.—On 14th February Fieldfares are reported to have been "on the island for the last 4 or 5 days"; flocks on 25th and 26th March (S.E.-S. fresh, haze) which stayed for several days. There were large numbers on 9th and 29th April, and the birds remained numerous till 2nd May. On the night of 5th May from 10 P.M. to daybreak on the 6th they were numerous on the lantern. In autumn the first, a solitary bird, was got at the lantern on the night of 23rd October; a few appeared on 28th October, and were also at the lantern that night. On 3rd and 5th November many were at the lantern, and a small rush is recorded on 14th November.

BLACKBIRD, *T. merula*.—A few stayed on the island all winter; on 7th March there was a small rush, and there were many at the lantern on the night of 21st March (S.E. fresh, haze). On 25th March and for several days there were numbers on

the island; there were a few at the lantern on 8th April, and a great many throughout the day on the 9th. Blackbirds nest on the island; I found their nests on the ground or in holes in stone gate-posts and such-like places. I saw very few till 22nd September, when a number arrived but stayed only two days; the next immigration was on 1st October, and they continued plentiful till the 4th, but appeared in renewed numbers on the 5th, and continued plentiful till I left. In the early morning of 23rd October a few were at the lantern; on the 24th and the next three nights some were reported at the light. From 6.30 P.M. on 3rd November till next morning a few were seen, and many from 1 A.M. till daylight on 5th November.

RING OUZEL, *T. torquatus*.—On the 26th April (N.E. light, clear) one was seen, and two next day. I only saw one, namely, on 5th October. On the night of 23rd October two came to the light; one on the night of the 27th; and three the next night.

WHEATEAR, *S. ænanthe*.—The first of the season is noted on 1st April, and one stayed on the lantern all that night; on the night of the 8th there were a few at the light, and next day they were present on the island in large numbers. On the night of 30th April they were numerous, as also from 12 to 4 A.M. on the morning of 4th May, and next night they were "swarming on the lantern from 11 P.M. till daylight on the morning of the 5th"; they were numerous from 10 P.M. on 5th May till daybreak on the 6th. Under date of 22nd June Mr. Maccuish writes, "Wheatears do not breed here; not one is to be seen." On 13th August the first detachment (consisting of two birds) of the autumn migrants arrived, and on the 17th and 20th single birds were at the lantern. When I reached the island on 10th September a few were to be seen till 22nd September, when a good many arrived and remained for a while. On 5th October there were fresh arrivals, which, however, passed on next day. A few came to the light with the big rush of migrants on the night of 23rd October, and one was observed on the island on 29th October.

WHINCHAT, *P. rubetra*.—Two of these smart little birds are reported on 5th May, and a beautiful male killed itself against the lantern on the night of 6th May. Whinchats were present from the 19th September to the 4th October. The largest number seen was on 25th September.

STONECHAT, *P. rubicola*.—A male on 8th October is the only record for the year; it frequented a large patch of thistles not far from the lighthouse.

REDSTART, *R. phoenicurus*.—On 1st May two Redstarts were on the island all day ; in the early morning of the 3rd five were at the light ; but they were “swarming on the lantern” from 11 P.M. on the 4th till daylight on the 5th, and next night they were again numerous.

On the return journey the first was seen on 23rd August, and one was at the lantern on the night of the 30th. I saw none till 19th September, when the wind at last came out of the W. into the S.E., and several appeared. On the 22nd a lot arrived, and many more came in on the 24th, when the island was full of Redstarts. A good many left on the 28th and only one or two remained, which stayed till 1st October. My last entry is a single bird on 6th October.

RED-SPOTTED BLUETHROAT, *C. suecica*.—On 22nd September (S.E. wind, very light) to my great joy I had my first glimpse of a Bluethroat ; it was among some rocks near the south end of the island, and was very wild, but before it disappeared I saw that it had a distinct stripe of blue, bordered with rust-red, on the breast. Next day I saw another also among the rocks ; this bird had the whitish throat of a young bird, but it was even wilder than the last. On the 24th there were two in Mr. Ross’s garden, and on the 25th several in the gardens. Thereafter I saw no more till 5th October, when one made its appearance in the lighthouse garden, but left the same day. They were so very wild that I only succeeded in securing one, a bird of the year. When about to alight Bluethroats spread out their tails like a fan, when the chestnut basal portion of the tail feathers contrasts strongly with the dark-brown terminal portion, forming a striking and most pleasing picture. They also have an attractive way of cocking their tails straight up into the air while sitting on the ground or on a wall, at the same time making a funny little bob.

REDBREAST, *E. rubecula*.—Mr. Maccuish reports single birds on 12th and 30th January, and 10th February (at lantern), and two on 12th February. On 27th April there were a great many all day, and they were numerous on the lantern from 10 P.M. on 5th May till daybreak on the 6th.

One reappeared on 6th September, and on the 10th I saw a Robin in the lighthouse garden. I observed single birds on eight occasions between 20th September and 2nd October, and several on 5th October. In some cases they were very wild indeed, and would not let one anywhere near them ; a wild Robin strikes one as a queer anomaly. This species participated in the great October rush. They were numerous all day on 17th October ; several were at the lantern on the night

of 23rd October ; a lot in the early morning hours of the 28th ; many from 8 P.M. on the 28th till daybreak on the 29th ; and a few on the night of 3rd November.

WHITETHROAT, *S. rufa*.—The first Whitethroat recorded for the season appeared on the lantern at 2 A.M. on 15th May, and in the early hours of the 17th four were attracted by the light, and another at 1.30 A.M. on 2nd June.

In the autumn one was at the light early on 19th August. I saw no Whitethroats on the island till 21st September, next day there were several about ; on the 25th several appeared ; and next day the gardens were full of them, and even amid the rocky parts one kept meeting Whitethroats at every turn, sometimes in the most unlikely-looking places ; in some cases they were extraordinarily tame. There was one at the lantern that night, but next morning (27th September) I found that the great body had gone on, only a solitary bird being visible. I saw but one more during my stay, on 5th October, in Mr. Ross's garden. There were many more of this species than last year.

LESSER WHITETHROAT, *S. curruca*.—On 24th September a Lesser Whitethroat appeared in the lighthouse garden. Next day I came upon a most wonderfully tame bird of this species in the same garden. It let me stand within a yard of it, without minding in the least, but would not quite allow itself to be touched. On the 26th September another came in, and another killed itself against the lantern that night.

BLACKCAP, *S. atricapilla*.—I saw more Blackcaps this year than last. The first, a full-plumaged male, was seen on 20th September, and flitted about in the hemlock tangle most confidently. Next day there were two males, and on the 22nd these birds had left and a female had arrived. On 23rd and 26th September and 5th October single birds were seen, all males ; on 7th October there were several males and one female, but next day only one male was to be seen. One came to the lantern on the night of 17th October.

GARDEN WARBLER, *S. salicaria*.—One arrived on 20th September, and there were several in the gardens and tangle every day till the 25th, one on the 26th, and one at the lantern that night. Thereafter only single birds on 2nd and 5th October. They sat very close in the patches of potatoes and were more abundant than last year.

GOLDCREST, *R. cristatus*.—Only two or three Goldcrests were observed during the autumn and winter of 1907-8, and none were observed during our stay on the island last year. This year, however, it was a very different story. The first record

is for 3rd September, when three birds of the year were killed against the lantern. During my stay I saw Goldcrests on eighteen different days; in numbers on 27th September and 7th and 8th October, and on other occasions in small quantities. They were very confiding, letting me stand within a yard of them as they flitted from one bit of hemlock to another, or crept about on the face of the cliffs. They were often taken at the lantern, and on several occasions came into the houses of the lightkeepers. After I left Goldcrests were numerous on 17th October, and there were a few at the light from 7.30 P.M. on 23rd October till daybreak.

YELLOW-BROWED WARBLER, *P. superciliosus*.—I saw this most attractive little Warbler on four occasions. I was standing in the lighthouse garden just as it was getting dusk on the evening of 22nd September, when a Yellow-browed Warbler flew over my head and settled on a patch of bare earth; though it was difficult to see it, I managed to secure it. The next appeared on the afternoon of 24th September in the hemlock tangle, and the third arrived next day in the lighthouse garden. The last was found lying dead under a rock not far from the lighthouse on 3rd October. The three procured were all males.

CHIFF-CHAFF, *P. collybita*.—I procured one specimen of this bird in Mr. Ross's garden on 5th October, and another was sent me which had killed itself on the lantern on the night of 23rd October, when a few are reported as having come to the light.

WILLOW WARBLER, *P. trochilus*.—The first record of this bird is on 30th April, when two came to the lantern, and next day they were numerous on the island. They were again numerous at the light from midnight to 4 A.M. on 3rd May. They were swarming on the lantern from 11 P.M. on 4th May till daylight on the 5th, and next night they were again present in numbers. The return migration is first noted on 17th August, when three came to the lantern; two put in an appearance at the light on the night of 20th August, and on the night of 3rd September, at 9 P.M., a bird of the year struck. On my arrival on 10th September, I saw two in the hemlock tangle, and next day one in the garden. Others were seen on the 19th, 21st, and from the 22nd to 26th.

SEDGE WARBLER, *A. schœnobænus*.—On 20th August one came to the lantern about midnight, and a bird of the year was killed on 3rd September. On arriving I found two in the hemlock tangle. I observed no more during the day, but one was got at the lantern on the night of 25th September, and two more next night; these birds were adults.

GRASSHOPPER WARELER, *L. naevia*.—An adult female was procured in a garden on 21st September.

HEDGE ACCENTOR, *A. modularis*.—One of these birds arrived on 28th September, and on 1st October there were two in the lighthouse garden; one appeared on the 2nd, and was joined by another on the 8th. These birds fought a good deal when we put them out of the garden on to the wall, attacking one another with a right good will.

BRITISH COLE TIT, *P. britannicus*.—One was procured in Mr. Ross's garden on 1st October (S.S.E. wind, extremely light). I watched it for some time as it sat on the telephone wire, calling and preening itself. [An interesting record, for we have little information regarding this species as a wanderer.—Eds.]

BLUE TIT, *P. caeruleus*.—On 30th September (W. wind, fresh) one was in Mr. Ross's garden; it was very tame and sat close in the currant bushes. [Another interesting observation.—Eds.]

WREN, *T. parvulus*.—On the night of 21st April one was taken at the lantern, and on 3rd October there was one in the lighthouse garden. On 7th and 8th October there were three or four about the gardens and tangle; they were almost as tame as the Goldcrests.

WHITE WAGTAIL, *M. alba*.—Four or five adults appeared on the morning of 20th September, but did not stay long, all having left by the afternoon.

PIED WAGTAIL, *M. lugubris*.—Mr. Maccuish reports three on 14th March, and "many about" on 1st April. I saw a few almost every day from 10th to 29th September, and single birds on 1st and 2nd October. This was by far the most numerous and wariest of the wagtails. Both adults and young were present.

GREY WAGTAIL, *M. melanocephala*.—Two appeared on 2nd October, and ran about on the grass catching insects, sometimes fluttering a short distance, when their beautiful colouring became very conspicuous.

MEADOW PIPIT, *A. pratensis*.—Seen in small numbers throughout my stay, with the exception of 13th September and 1st October; from 19th to 25th September there were a good many. On 15th September I saw one parachuting and singing.

TREE PIPIT, *A. trivialis*.—One was killed at the light on the night of 6th May. On the southward migration two were obtained, one at the lantern on the night of 26th September and one in Mr. Ross's garden on 28th September.

ROCK PIPIT, *A. obscurus*.—Mr. Maccuish informs me that this species remains on the island throughout the year. I saw them every day; a good many from the 14th to 28th September; otherwise a few only.

GREAT GREY SHRIKE, *L. excubitor*.—One was caught in the lobby of the lighthouse at 6 P.M. on 25th October, and sent to me. It proved to be a female with a single wing-bar.

SPOTTED FLYCATCHER, *M. grisola*.—The only spring record is for 7th May, when one came to the lantern at 11.30 P.M. In autumn I saw two on 25th September, one on the 26th, and one was killed at the lantern the same night.

PIED FLYCATCHER, *M. atricapilla*.—The first of these nice little birds came in on 19th September, and frequented the ravine. It had a way of sitting on a pinnacle of rock and shrieking without intermission for several minutes. I often heard it long before I came in sight of it, and at first I could not think what bird it was that was making such an unholy noise. There were one or two about till 23rd September, a good many on the 24th and 25th, two or three on the 26th, and a good many at the lantern that night; one on the 28th. The light seems to have a great attraction for these birds, and if there were any on the island they were sure to turn up at the lantern, if the night were at all favourable. They frequented both the gardens and the rocks, and were very wild at the beginning of the migration, but much tamer ere its close.

SWALLOW, *H. rustica*.—The only spring record is for the 11th May. In autumn I saw one on the 12th September, two on the 15th (one young and one old), several on the 22nd, one on the 23rd, and several flying over from north to south on the 24th.

HOUSE MARTIN, *C. urbica*.—I have only two notes of this species, one on 15th September and three going south on 29th September.

SAND MARTIN, *C. riparia*.—One flew over from north to south on 11th September.

SISKIN, *C. spinus*.—A flock of seven appeared on 22nd September. I think they were probably a family party, as they consisted of one male in good plumage, and six in the duller dress of the female and young. These stayed for three days, and a fresh small flock came in on 25th September; there were three or four on the 26th; a pair, ♂ and ♀, on the 29th; and on 3rd October there were three, one being a beautiful male. One came to the lantern on the night of 17th October, and a few during the small hours of 28th October. All were wonderfully tame while they pecked away at the heads of thistles.

GREENFINCH, *L. chloris*.—Under date of 11th March, Mr. Maccuish reports "several seen for several days." I saw none, but there were a lot at the lantern on the night of 17th October.

TREE SPARROW, *P. montanus*.—There were a party of five when I arrived, but they were reduced to three before I left; presumably the hawks had taken toll of them. They were very wary birds, being up and away long before one got anywhere near them.

CHAFFINCH, *F. œlebs*.—On 21st September, about 9 P.M., several Chaffinches made their appearance at the light, and next morning a flock of about fifteen were on the island. These were augmented by further arrivals on the 25th, and on the 26th there was a very large flock. On 27th and 28th September they were still numerous, and a few remained for the next three days. On 6th October another small party arrived, and were still on the island when I left. A lot are reported at the lantern in the big rush in the early morning of 28th October.

BRAMBLING, *F. montifringilla*.—Two birds appeared on 25th September (S.E. wind, very light), and consorted with the Chaffinches. Next day and on the 28th there were single birds. The next arrival was on 2nd October; in the morning a flock of about half a dozen birds was to be seen, and about 4 P.M. another small flock came in from the north and joined the others. These birds stayed for some time, receiving a further addition to their number on 6th October, but there were only a few left on the 8th. A good many Bramblings are reported at the lantern early on the morning of 28th October.

LINNET, *L. cannabina*.—On 11th March one appeared on passage. During my stay I saw Linnets on four occasions, one on 19th September, three on 6th October, and single birds on 7th and 8th October; in each case they were very wild.

MEALY REDPOLL, *L. linaria*.—Two came to the lantern on the night of the 29th December 1907, and single birds are reported on the 13th and 18th January and 8th February. On 12th March a bird in dark plumage was procured.

SCARLET GROSBEEK, *C. erythmus*.—On 12th September, about mid-day, I was standing in the lighthouse garden when a bird flew over the wall, coming from the east, and settled on the oats, where it sat uttering a soft "twe-eek" at intervals. I recognised it as a Scarlet Grosbeak, having seen one on the May last year, and watched it for some time as it fluttered gently from one oat-stalk to another. The bird then flew on to the wall, when I procured it; it proved to be an adult female.

REED-BUNTING, *E. schaniclus*.—This was the only kind of Bunting that I saw on the island. A single bird arrived on 24th September and was seen the next two days ; on 27th and 28th September there were two, and one on the 30th. A single bird on 7th October. These Buntings were extremely wild.

SNOW-BUNTING, *P. nivalis*.—On the 2nd January and 21st and 26th March single birds are reported, and one was killed at the lantern on the night of 25th October.

SKYLARK, *A. arvensis*.—On the nights of 10th, 20th, and 26th February and 4th March a few are reported at the lantern ; a small rush on the night of 7th March, and a few at the light on the night of 1st April. From 19th September onwards I saw a few Skylarks most days ; a lot passed over from north to south on 2nd October, and on several occasions they came to the light. On 17th October they were numerous during the day and several were at the lantern at night ; in the early morning of 23rd October a few are reported, and the same next night.

STARLING, *S. vulgaris*.—On the night of 10th February there were a few at the lantern, and on 7th March a small rush. On the 25th March there were flocks all day, and on 26th March "great flocks which stayed several days." On the night of 1st April there was a great rush all night.

I saw Starlings every day, a few to begin with, increasing gradually towards the end of my stay. On several occasions they came to the lantern and sat on the hand-rail, gazing in at the light till daylight came ; they were difficult to catch, hurrying round the rail when pursued. This species figured largely in the big rush on the night of 17th October, a few in the early morning of 23rd October, and many next night. Other movements are recorded for 27th and 28th October, and for 3rd and 4th November.

JACKDAW, *C. monedula*.—Mr. Maccuish reports that great flocks came in on 26th March and stayed for several days. On 28th October there were a few on the island.

HOODIE CROW, *C. cornix*.—Flocks are reported on 25th March, and great flocks next day. These birds stayed several days. A flock is recorded on 18th October, and a big flock throughout the day on 28th October.

ROOK, *C. frugilegus*.—On 9th January one was seen, and three on 5th March ; on the night of 6th March one struck the lantern and was killed. This species participated in the great rush on 25th and 26th March, flocks being reported for the former date, and "great flocks which stayed for several days" for the latter. In autumn a large flock is reported on 28th October.

SWIFT, *C. apus*.—8th May is the first record, and single birds are reported on 13th, 16th, and 23rd May.

WRYNECK, *J. torquilla*.—I saw a Wryneck on the wall of the light-house garden on 20th September, and one came to the lantern on the night of 26th September.

CUCKOO, *C. canorus*.—The first of the season was heard on 4th May, and on 18th and 24th May single birds were seen. On the return journey a bird of the year was procured on 20th August.

SHORT-EARED OWL, *A. accipitrinus*.—On 7th March one was seen at midnight, busily engaged in chasing other migrants that were attracted by the light. On 26th March, 1st April, and 3rd and 4th May single birds were seen.

Two were reported on 24th September, one on 25th October, and another on 29th October. On 13th November one was observed by Mr. Maccuish chasing a Redwing.

PEREGRINE, *F. peregrinus*.—I saw a bird of the year on four occasions, on 20th September and from the 3rd to the 5th October. Once I saw it single a bird out from amongst a flock of Starlings; it stooped at the Starling three times, but each time the pursued one dodged just at the critical moment, and it eventually escaped, for the time being, anyway. After this chase the Starlings would not move for an hour or so from the telephone wire, or flag-staff, or wherever they happened to be sitting. Once I saw a Herring Gull chase the Falcon away, but Herring Gulls will chase most things.

MERLIN, *F. aesalon*.—One was to be seen most days from 26th September to 8th October. I was walking over the island one day when I heard a great twittering, and looking up saw a Sky-lark being pursued by a Merlin. There was a great chase, but by vigorous dodging the Lark managed to elude its pursuer.

KESTREL, *F. tinnunculus*.—One noted in spring on 29th April. I saw one or two occasionally, and on the night of 4th October a male was caught at the lantern. On one occasion a Kestrel was seen to kill and eat a Chaffinch, and twice I saw four or five Herring Gulls mob and chase one of these birds with such ardour that it had to twist and turn to escape the rushes of its pursuers; it was quite routed, being driven away to the south of the island.

HERON, *A. cinerea*.—Seen in small numbers on the rocks most days during my stay on the island. The Herring Gulls used to mob and hustle this species too.

BERNACLE GOOSE, *B. leucopsis*.—A single bird reported by Mr. Maccuish on the 31st March.

- MALLARD, *A. boschas*.—The only note for the year is one bird seen by Mr. Maccuish on 2nd May.
- SHOVELLER, *S. clypeata*.—Mr. Maccuish reports a beautiful drake on a small pool near the lighthouse on 2nd May.
- TEAL, *Q. crecca*.—Seen on six occasions from 12th September to 7th October, from one to six at a time.
- WIGEON, *M. penelope*.—On 21st October a small flock came in, one female was procured by Mr. Maccuish and sent to me.
- TUFTED DUCK, *F. cristata*.—Five flew close over my head on 21st September, they were going S.E.
- EIDER, *S. mollissima*.—I saw Eider throughout my visit, a fair-sized flock when I arrived, which was augmented by fresh arrivals on 24th September, and yet more appeared on 1st October. On 11th September I saw an Eider duck with five chicks, still small and downy; by 28th September one drake had assumed his full plumage, but there were many in various stages of eclipse.
- BLACK SCOTER, *Æ. nigra*.—Only once seen by me, viz., on 29th September, when a small flock consisting of two ducks and three drakes arrived, and after circling round several times settled just outside the harbour, among a flock of Eiders.
- WOOD PIGEON, *C. palumbus*.—I have only three records for the year, viz., single birds on 28th March and 22nd September, and two on 23rd September.
- CORN-CRAKE, *C. pratensis*.—One appeared on 7th May, and one was heard craking at 5 A.M. on 19th May.
- MOORHEN, *G. chloropus*.—On 2nd April one came to the lantern at 3 A.M., and on 11th May one was found dead on the island.
- GOLDEN PLOVER, *C. pluvialis*.—"A few" were observed on 2nd May. On the return journey a small flock appeared on 22nd September and stayed till the 24th. One of the flock killed itself against the lantern, and another on the telephone wire.
- RINGED PLOVER, *Æ. hiaticula*.—On 20th September one was trotting about by the harbour, and on the night of 4th October one was caught at the lantern; both were birds of the year.
- LAPWING, *V. vulgaris*.—15th February is the first record of Lapwings for the year, one being noted at the lantern. On 5th March five or six were attracted by the light; on 21st March "a few, 11 P.M., one killed." On the night of 1st April there were many at the lantern. In autumn one appeared on the 19th and 20th, four on the 21st, and two on the 22nd and 24th September. On 3rd October, three flew over going south, and on the 5th, four or five spent the day on the island. I

constantly heard them at night, calling in the rays. Other records are for 29th October, and the nights of 3rd and 5th November a large flock at the light, two being killed.

TURNSTONE, *S. interpres*.—Seen in small numbers on the rocks throughout my stay.

OYSTERCATCHER, *H. ostralegus*.—One bird of this species is reported on 19th February, and four on 14th March. Mr. Maccuish tells me that they nested on the island, and I saw them constantly while I was there, in numbers ranging from one to seven.

WOODCOCK, *S. rusticola*.—Single birds are reported on 3rd and 9th January and 7th February; several on 21st March; on 27th March several at the lantern, one killed; on 1st May two are reported, and several next day. In autumn several were seen on 21st October; on the 23rd and 27th two came to the lantern; on the 28th a few, and several came to the light in the small hours of 5th November.

SNIBE, *G. caelestis*.—Seen on seven occasions between 22nd September and 8th October, one or two birds each time, and once I flushed one in Mr. Ross's garden. One bird killed itself against the lantern on the night of 5th November.

JACK-SNIPE, *G. gallinula*.—Single birds are noted on 20th February, 24th September, 8th and 29th October.

DUNLIN, *T. alpina*.—A small flock turned up on 23rd September, and I saw a single bird by one of the little pools on the island on 26th September.

PURPLE SANDPIPER, *T. striata*.—I saw four on the 13th, and two on the 17th, 19th, and 27th September; as usual, they were very tame.

REDSHANK, *T. calidris*.—Mr. Maccuish reports that these birds leave the island during summer, 13th August being the date of the first to return. I saw them constantly on the rocks and at the pools throughout my visit.

CURLEW, *N. arquata*.—On 1st April a few are reported at the lantern. I saw them throughout my stay, but never in large numbers.

COMMON TERN, *S. fluviatilis*.—On 11th, 13th, and 15th September flocks were passing, they flew very close to the water in a south-westerly direction. On the night of 26th September an immature bird was taken at the lantern.

SANDWICH TERN, *S. cantiaea*.—On 13th September I saw two, and on the 15th three or four flew by; on the 17th several small flocks passed; on the 27th two; and on 4th October four were seen.

BLACK-HEADED GULL, *L. ridibundus*.—I saw only a single bird during my stay, on 13th September.

COMMON GULL, *L. canus*.—One on 15th September.

GREATER BLACK-BACKED GULL, *L. marinus*.—There were Greater Black-backs about the island throughout my visit, a good many from 12th to 19th September, otherwise a few only.

KITTIWAKE, *R. tridactyla*.—On 15th March great numbers are reported as being on the cliffs all day. On 22nd June they were laying. They were numerous during my stay, and were usually to be seen some little way out to sea.

GREAT SKUA, *S. catarrhactes*.—On 6th October I noticed that something had disturbed the Gulls on a rock, a little way north of me, and then I caught sight of a Great Skua, which, however, paid no attention to the Gulls, but flew towards the south rather close to the surface of the sea and quite near the island. The white alar patches were very conspicuous.

ARCTIC SKUA, *S. crepidatus*.—I saw single birds on six occasions between 12th September and 6th October, they were usually employed in chasing the Kittiwakes, and I saw one that appeared to be extra aggressive, giving an immature Kittiwake a very bad time. Not content with making swoops at its victim it closed with it, grappling it with its feet, and the two birds tumbled over several times in the air together. Then the Kittiwake got away, but the Skua pursued it and hit it several times with its bill, and at last I saw the aggressor seize the poor little bird by the back of the head with its beak and hold on for some time, all this in the air. Occasionally the Kittiwake sought to escape by sitting on the sea, but each time the Skua made it rise by flying very close over its head. The whole time of the chase, the Kittiwake screamed dolefully, and at last it got away and sat on a rock, looking very rueful and dragged.

STORM PETREL, *P. pelagica*.—One of these little birds came to the lantern at 12.30 A.M. on 31st October.

FORK-TAILED PETREL, *P. leucorrhoa*.—A beautiful specimen came to the lantern in the early morning hours of 7th October (S.W. wind, very light, hazy), the first I had ever seen in the flesh.

MANX SHEARWATER, *P. anglorum*.—On 22nd September at 7.15 P.M., I was startled by hearing loud shrieks coming from the lantern; they proved to have been uttered by a Manx Shearwater, which was attracted by the light. When caught it screamed loudly and constantly, and bit so viciously as to draw blood each time.

BLACK GUILLEMOT, *U. grylle*.—On 3rd January one was procured by Mr. Maccuish and sent to us.

LITTLE GREBE, *P. fluviatilis*.—I found a Dabchick lying dead in the harbour on 24th September, and another appeared on the pond in the ravine on 1st October; it was very shy and took refuge under the overhanging parts of the south bank where it was well hidden.

ROSELEA, UPPER LARGO, FIFE.

THE DEAL-FISH OR VAAGMAER, *TRACHYPTERUS ARCTICUS* (BRÜNN.), ON THE COAST OF EAST LOTHIAN.

By WILLIAM EVANS, F.R.S.E.

SIX months ago I had the satisfaction of recording in this Magazine (1908, p. 150) the stranding of an Oar-fish at Dunbar. I now have the further satisfaction of recording the occurrence of a specimen of another member of the same remarkable family, namely, the Deal-fish or Vaagmaer (*Trachypterus arcticus*), near the same place.

Early on Saturday, 28th November 1908, a fisherman out gathering bait came upon a strange fish of large size lying dead on the sands at high-water mark, about a quarter of a mile east of Barnsness Lighthouse, near Dunbar. An attempt was made by the finder and other fishermen to remove the fish to Dunbar, a distance of over three miles; but the rough handling to which it seems to have been subjected soon told upon it, the head being severed from the body and other damage inflicted, with the result that it was abandoned in a worthless condition, and subsequently buried at no great distance from where it was found. Fortunately Mr. George Pow, Dunbar, interested himself in the matter, and having unearthed the mutilated remains, kindly secured a couple of "cuts" for me, one being a transverse section from about the middle of the body, the other the terminal 10 inches. These I examined on 5th December, and had no difficulty in identifying them as portions of a Deal-fish (*Trachypterus arcticus*), a view in which Mr. Eagle Clarke, to whom I showed them the following day, entirely

concurrent. The rapid convergence of the outlines of the body to the point where the caudal fin (which, unfortunately, was gone) had sprung from ; the sub-central position of the lateral line with its curious plates ; the cartilaginous tubercles along the ventral margin,—these and other features were all characteristic of this species. The presence of roe proved it to be a female. Reports in the newspapers referred to it as another Oar-fish.

From conversation with some of the men who had seen the fish and roughly measured it while it was whole, I ascertained that its length was about 6 feet—two good paces. The transverse section examined by me, which may not have been from quite the deepest part of the body, gave a depth of 13 inches exclusive of fin ; at its thickest it was only one inch and a quarter, showing the ribbon- or deal-like form of the creature. At 10 inches from the end of the vertebral column the depth diminished to 7 inches. The dorsal fin had been much broken and torn, so that it is impossible for me to say precisely what its original height may have been ; but some of the spines, and these not quite entire, in the middle portion were fully $3\frac{1}{4}$ inches long. All I could learn about the head was that the mouth-parts protruded much, suggesting to one imaginative mind the profile of a calf ; to another, that of a hound. In this connection it is interesting to note that Smitt, in his "History of Scandinavian Fishes," says its appearance, when the mouth is protruded, is "not unlike that of a swine's snout." As regards colour, the silvery epidermis seems to have been mostly rubbed off by the time the fish was found, leaving it of a dull grey or yellowish-grey tint, the long dorsal fin retaining, however, traces of the bright red colour for which, in life, it is remarkable. Although giving off an offensive oily smell, the parts given to me were in a fairly fresh condition, and I do not think the fish could have been long dead when discovered.

The only previous record of the Deal-fish from the Firth of Forth appears to be that of a specimen 5 feet 4 inches in length, which was cast ashore on the coast of Fife, near Elie, in the beginning of April 1848, and sent to Prof. Reid of St Andrews, who published a very full description of it in the "Annals and Magazine of Natural History" the follow-

ing year.¹ From other parts of Scotland, more especially Orkney, over a score of examples have at one time or another been reported. Day figures one in his "British Fishes" which was captured at Montrose in April 1872; and in Sim's "Vertebrate Fauna of Dee" there is a record of one caught at Buckie in April 1878, and of another cast upon the beach at Mennie, Aberdeenshire, in August 1888. More recently specimens have been recorded in this Magazine² from Shetland (June 1896), Orkney (April 1896), and Banff (March 1905).

According to Smitt ("Scandinavian Fishes," 1893), "the true home of the Deal-fish is unquestionably in the deeper, if not the deepest, parts of the North Atlantic." It belongs, he explains, to the abyssal depths between Iceland and the North of Norway, and has oftenest been met with north of the polar circle, but also on several occasions off the South of Norway.

THE FALSE-SCORPIONS OF SCOTLAND.

By ROBERT GODFREY, M.A.

(Continued from p. 161, No. 67, July 1908.)

Chernes nodosus (Schränk) 1803.

As a Scottish species little is yet known about this deeply interesting form. The first recorded Scottish specimen was obtained by Mr. J. F. Jeffrey, August 27, 1895, in the herbarium of the Edinburgh Botanic Gardens; two others were found by my friend Mr. Alex. Baxter, in August 1900, attached to the leg of a fly in a chemist's shop in N.-W. Circus Place, Edinburgh. One of these latter was killed along with the fly, but the other was taken alive to Mr. Wm. Evans, to whom the previous specimen from the herbarium had also been forwarded.

The ordinary habitat of *Ch. nodosus*, as Mr. Wallis Kew has pointed out to me, appears to be among refuse; that is, in accumulations of decaying vegetation, manure-heaps, frames, and hot-beds in gardens. He refers to its occurrence in a manure-heap in the open air at Lille, and draws my attention to its abundance in a melon-frame near Hastings in 1898, where it was found by Mr. W. R. Butterfield.

¹ Vol. iii. 2nd series, pp. 456-77.

² "Ann. Scot. Nat. Hist." 1896, pp. 159, 160; and 1905, p. 184.

I may say that on June 14, 1904, I saw a *Chernes* on the wooden label of a flower-pot in the Edinburgh Botanic Gardens. I thought I had inserted the creature carefully in a tube, but I could not afterwards find it, and without microscopic examination I cannot tell what the species may have been.

Chernes dubius, Cambridge, 1892 (= *Chelifer tullgreni*, Strand).

At the time of the publication of Cambridge's "Monograph," 1892, this species was known from two specimens only, and its name implied Cambridge's hesitation in allotting it specific rank, but the obtaining of further material has abundantly justified the correctness of his decision in marking it off from allied forms as a distinct species.

On April 12, 1901, I found the first Scottish example, but I could not authoritatively place it under this name till January 1907. I erroneously recorded the species in the "Annals of Scottish Natural History," 1901, as Simon's *Chernes phaleratus*, a form that has not yet occurred in Scotland.

Chernes dubius is an abundant species in the "Forth" area. Its main haunts are close to the sea, under stones a few yards from high-water mark, but it occurs inland also on rocky patches of ground which preserve to some extent their natural condition. In West Lothian, where I first found it, the haunt is under stones deeply embedded in the soil on the Bonnytoun hills near the farm of Northbank; a single immature specimen was also taken in another locality near Northbank from a piece of rock tightly embedded in the face of a disused quarry. In East Lothian it occurs on North Berwick Law, where I took five under a stone on May 19, 1903; and in Fife also, to the west of Aberdour, where during 1902-3, I found thirty-nine specimens, I took the first under large stones firmly buried in the soil on rocky ground left in a natural state. Further search at Aberdour revealed the stronghold of the species to be just above the tide-mark, not only under deep stones, but also under very small stones from just over an inch broad, and even on the sand under a stone. To the east of Crail, and also at a headland near Cambo in the "Tay" area, I discovered this species commonly in September 1905, on natural ground within a short distance of the sea.

Outside of the "Forth" and the "Tay" areas this species (in Scotland) has been detected only in Ross-shire, where Robert Whyte obtained two on a piece of drift-wood lying on the shore near Balmacara House on August 27, 1906. Under the same beam were *Ideoroncus cambridgii* and *Chthonius rayi*.

Chernes dubius—measuring from 1·5 to 2 millimetres in its adult state—has deep red-brown palpi and a yellowish upper surface which darkens with age. Its colours harmonise well with its home, and, although it is quite conspicuous when once detected, it may

readily be overlooked. Often at a first glance have I failed to see specimens on stones which on a more careful survey would yield me two or three individuals; on such occasions I should sometimes have missed them altogether but for the minute examination to which I subjected the stones in the belief that I was in their haunts. If one's attention is turned away from the creature for a few seconds, some difficulty is often experienced in detecting it again.

Several individuals are often found together, and the creature associates freely with *Chthonius rayi*, and to a less extent with *Ch. tetrachelatus* and *Obisium muscorum*. It moves slowly, generally keeping its nippers partially extended, and constantly varies the position of its pedipalps, that every corner within range of the great pincers, as the creature advances, may be thoroughly investigated. The long pedipalps, exploring regions so far comparatively from its head, give the creature a rather unwieldy appearance.

On one occasion a *Chernes dubius* which I had turned up had three eggs, apparently those of a mollusc, attached to its chelicerae. Thinking that these were merely in accidental touch with the creature I proceeded to remove them, but on doing so, I found that they were being held by the animal, and, although at my next attempt I separated the eggs, I was then convinced that they were being sucked by the False-scorpion. On another occasion I saw a *Ch. dubius* carrying a larval centipede in one of its great pincers. The slow but persistent activity of this species, when under observation, leads one to infer that it is accustomed to be ever on the hunt for food. One wonders how such a little blind animal of this kind can procure food at all, but, though our little friend may require great patience before he effects a capture, he no doubt makes a lasting meal off a single catch.

The finding of nests containing individual immature specimens, on September 12, 1903, at Aberdour in Fife, was a great event in my working out of the life-history of these animals. I lifted up a large stone resting firmly near high-water mark in the kind of position which experience had taught me offers a tempting home for *dubius*; at first glance the stone, which was covered with many little pits, revealed nothing, but a second glance detected *Chthonius rayi*, then a *Chernes dubius*. The latter I touched with a pin from behind, and it responded very feebly and slowly to the touch, betraying nothing of the activity of *Ch. rayi* in facing round to the enemy. Meanwhile two more *Ch. rayi* came under my notice, and the possibility of the presence of nests occurred to me. A very short search revealed a small, but typical, False-scorpion's nest; I opened it carefully with a pin, and, to my intense surprise and delight, there issued from it a young *Ch. dubius* of the light hue so characteristic of all False-scorpions when beginning a free life or after having moulted. There were many nests on the stone, and out of

four of these I took immature *Ch. dubius*. The nests were very thin, fine silky cocoons, covered with minute specks of sand and earth exactly resembling a blob of sand; they measured from 2.5 to 3 mm. in diameter, with contained creatures just over one millimetre long. On emerging, young *dubius* was quite active and very sensitive; one placed in a chip-box, on coming into touch with the inequalities of the box drew back its pedipalps close to the fore-body, keeping the tibia and the nippers directed outwards nearly at right angles, and retreated in this fashion. My inference at the time was that the youngsters were hibernating within the cocoons, but I was then ignorant of the moulting-process taking place inside a nest; and that these young False-scorpions were really moulting was proved two years later at Cambo, when I again found in the month of September numbers of nests of this species, in four of which at least were the cast-off moults of immature specimens.

Ch. dubius does not appear to hibernate inside a cocoon. Some of the adults at least live in winter in a free condition under stones. In their Aberdour haunt, on November 26, 1904, during hard frost which had continued for some days, I found three individuals under stones in a wood. They were alive but practically inert, and, one would say, almost dormant. Two which I kept alive were active enough at night, however, on my reaching home. Aird and Robert Whyte found the species living free on December 22, 1906, in the same locality.

On October 1, 1904, I succeeded in finding in the Aberdour stronghold the female with her embryonic young attached to her. I had long been expecting to discover *Ch. dubius* with her young inside a nest, but Mr. Wallis Kew had from his knowledge of allied species suspected that there would be no nest for reproductive purposes, and stated this to me in our correspondence. My discovery proved that he was right, for the adult was quite free, in no cocoon whatever, but simply resting in a small depression on the underside of a stone, with her irregularly-shaped white embryonic mass attached to the underside of her abdomen.

Chernes panzeri (C.L. Koch), 1836 = *C. rufescens*, Sim.; Camb., 1905.

My first introduction to this species was in April 1907, at the hamlet of Grange, Borrowdale (Cumberland), in the neighbourhood of which Aird and Robert Whyte were spending their Easter holidays in pursuit of False-scorpions. While collecting *Cheiridium museorum* in a barn, on April 11, they obtained a specimen of *Chernes panzeri* on the under side of a stone buried among hay. Six days later they took me to the same barn, where, by lifting stones deeply embedded in the earthen floor, we found both old and young individuals somewhat commonly. Several specimens were living under a cake of damp hay and barn refuse that was

closely attached to the under side of a large stone. In three different barns we came on the creatures, and on April 18 we discovered typical nests, made of stable refuse with a tough silk lining. The first nests met with, being empty, did not afford us the full evidence necessary for connecting them with this species, but later nests contained the moults of the animals. The nests varied from 3 to 5 millimetres in cross diameter; and many nests were placed closely together on one stone.

On June 28, in the same year, I took my first Scottish specimens. While examining a hay-loft in Walls Street, Glasgow, I found on a piece of wood a False-scorpion's nest containing the moult of a great nipper, and, by sifting rubbish in the neighbourhood of the wood, I obtained three individuals of *Ch. panzeri*. On July 1, I obtained a fourth specimen by a similar process and came on moulting nests on wood and in a clotted mass of straw. Again, on September 14, Aird Whyte and I obtained three adults from the same stable by sifting refuse from one of the stalls.

Meanwhile, in August 1907, at Balmacara, Messrs. Whyte and I found this species tenanting two byres, from one of which we took eighty specimens. The False-scorpions were living safely in the undisturbed refuse that filled the gaps between planks of wood and the wall, and were so numerous that a single handful of refuse was tenanted by quite a colony. On August 24 a female carrying her embryonic mass was shaken out of some refuse; she thus appeared to have been living a free life, but she may have been resting in a snug enough cranny of the compact refuse mass before she was disturbed by my intrusion.

On the East of Scotland the species was detected at the farm of Haswellsykes, Peebles, by Alastair Urquhart, on September 24, 1907.

(*To be continued.*)

REVISION OF THE HYDRACHNIDÆ IN JOHNSTON'S "ACARIDES OF BERWICKSHIRE."

By WILLIAM WILLIAMSON.

THROUGH the courtesy of Mr. Wm. Evans, F.R.S.E., my attention was drawn to a series of papers by Dr. Johnston, on the "Acarides of Berwickshire," in the early volumes of the "History of the Berwickshire Naturalists' Club." In these papers Dr. Johnston deals with thirty-six species, of which only three are referable to the Hydrach-

nidæ or water-mites. Apart from any interest attaching to the species themselves, the record is interesting as it constitutes, so far as I know, the earliest British record of Hydrachnids.

Dr. Johnston describes these three species under the names of *Hydrachna cruenta* Müll., *Atax histrionicus*, and *Hydrachna naïca*, the last being a new species. A consideration of Dr. Johnston's descriptions leads me to the conclusion that

Hydrachna cruenta Müll. (Johnston) = *Diplodontus despiciens* (Müll.).

Atax histrionicus = *Limnesia histrionica* (Herm.).

Hydrachna naïca Johnston = *Hygrobates reticulatus* (P. Kram.).
= *Hygrobates naïcus* (Johnston).

DIPLODONTUS DESPICIENS (Müll.).

Johnston described what he believed to be *Hydrachna cruenta* Müll., but his description of the eyes points not to the genus *Hydrachna*, in which the two lateral eyes are fused together and enclosed in a capsule, but to *Diplodontus*, in which the two lateral eyes are separated one behind the other, and are situated on the body margin, where, owing to bulging of the body, they are at times seen with some difficulty.

In describing the palpi as four-jointed, Johnston evidently considered the fifth segment as a claw, which, in this case, is opposed to a pointed elongation of the fourth segment so as to form a chela-like termination to the palpus.

LIMNESIA HISTRIONICA (Herm.).

I do not see any reason to doubt that the species described by Johnston as *Atax histrionicus* Dugès is any other than *Limnesia histrionica* Herm., although the length of the palpus as compared with that of the body is rather shorter than usual.

HYGROBATES NAÏCUS (Johnston).

SYN.

1848. *Hydrachna naïca*, Johnston. "History of the Berwickshire Naturalists' Club," vol. ii. p. 314.

1879. *Nesæa reticulata*, Kramer. "Archiv für naturgeschichte," vol. i. p. 11.

1881. *Hygrobates gracilis*, Haller. "Mittheilungen der Bern. naturforschenden Gesellschaft," Heft ii. p. 68.

SYN.

1892. *Hygrobates reticulatus*, Koenike. "Zoologischer Anzeiger," vol. xv. p. 268, No. 396.
- 1897-1900. *Hygrobates reticulatus*, Piersig. "Zoologica," Heft xxii. p. 197 (Deutschlands Hydrachniden).
1899. *Hygrobates reticulatus*, Soar. "Science Gossip," vol. vi. p. 38.
1901. *Hygrobates reticulatus*, Piersig. "Das Tierreich," Lief. xiii. p. 187. (Hydrachnidæ u. Halacaridæ—Piersig u. Lohman.)

The following record the name only :—

1900. *Hygrobates reticulatus*, Soar. "Journal of Quekett Micro. Club," Ser. 2, vol. vii. p. 392.
1902. *Hygrobates reticulatus*, George. "Naturalist," p. 14.
1904. *Hygrobates reticulatus*, Halbert. "Irish Naturalist," vol. xiii. No. 9, p. 201.
1905. *Hygrobates reticulatus*, Soar. "Transactions of Norfolk and Norwich Naturalists' Soc.," vol. viii. p. 88.
1906. *Hygrobates reticulatus*, Rousseau. "Mémoires de la Société Entom. de Belgique," xii. p. 186.
1907. *Hygrobates reticulatus*, Williamson. "Proc. Roy. Soc. Edin.," vol. xxvii. pt. iv. p. 304.
1907. *Hygrobates reticulatus*, Walter. "Revue Suisse de Zoologie," vol. xv. p. 527.
1907. *Hygrobates reticulatus*, Maglio. "Rendiconti del R. Ist. Lomb. di Sc. e lett." Serie ii. vol. xl. p. 967.
1908. *Hygrobates reticulatus*, Maglio. *Ibid.* vol. xli. p. 193.

Before considering Dr. Johnston's description, it will be of advantage to review the literature since Kramer's time, dealing with the species hitherto known as *Hygrobates reticulatus* P. Kram.

In 1879 Kramer described a new species under the name of *Nesæa reticulata*. The information he gives is confined to a description of the reticulated skin and of the genital plates. With regard to the latter, it is very evident from his description and from the figure which he gives, that the specimen he had before him was a nymph and not a male as he supposed.

In 1881 Haller described a new species which in some respects resembled *Hygrobates longipalpis*. The principal points of difference pointed out by Haller between *H. longipalpis* and the new species, were the structure of the palpus and the hexagonally faceted body-skin.

In the same communication he also records *Nesæa reticulata* Kram. with which in his table of synonymy he associates *Nesæa lutescens* of Lebert. Reference to Lebert's memoir ("Bull. Soc. Vaud. Sc. Nat." xvi., 1879), and to Koenike's revision ("Zeitschr. f. Wiss. Zool." Bd. xxxv. p. 626), shows the association to depend

on the fact that in each case there are two small genital plates, each with two discs. It is well known now that what was then considered to be a distinct species, is only a stage in the life-history—the nymphal period.

In 1892, after pointing out that *Nesæa reticulata* Kramer was the nymphal form of the species which Haller later described as *Hygrobates gracilis*, Koenike established *Hygrobates reticulatus* Kram. as the name of the species.

Piersig, in his large treatise on the German water-mites ("Zoologica," H. xxii.), and again in his work on the family Hydrachnidæ ("Das Tierreich," Lief. xiii.), makes use of Kramer's *Hygrobates reticulatus*.

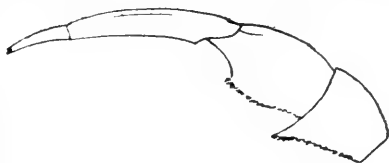
In recording specimens found within the Britannic area, C. F. George, Halbert, Soar, and I have also continued the use of the same name.

As indicated by Haller, the main points in identification are the structure of the palpus and the reticulated skin. Fortunately, Dr. Johnston, when describing his specimen, described these two points in detail.

The only literature on mites available to Dr. Johnston was the works of Müller and Dugès, together with Koch's "Übersicht." Not being able to identify his specimen from these, with some diffidence he described it as a new species. His diagnosis is:—"H. orbicularis albescens maculis fuscis fusè signata, oculis 2, pedibus pellucidis albis sparse spinosis, palpis articulis inferioribus crassis minutissime serrulatis."

After describing the shape and colour of the body, he gives the following description of the palpus:—"pediform, proportionately large, thicker than the legs, 4-jointed, the 1st and 2nd joints thick and short, minutely serrulated on the outer edge, a rough or granulous mucro at the articulation of the first joint, 3rd joint elongate and slender, 4th small and unquiform, and terminated with two minute claws."

The normal number of segments in the hydrachnid palpus is five, but a reference to Johnston's figure shows that he has not taken the basal segment into consideration. Consequently, the first, second, third, and fourth segments of Johnston's figure are respectively the second, third, fourth, and fifth segments of normal specimens.



PALPUS OF *HYDRACHNA NAÏCA*
(AFTER JOHNSTON).

Johnston's figure does not show the two hairs which stand one behind the other on the flexor edge of the penultimate segment,

but he shows distinctly the thickened lower segments with their serrulations and the flexor surface of the second segment (Johnston's first segment) continued to a sharp point (not blunted as in *H. longipalpis*), and this, coupled with the general description and particularly that of the skin "when highly magnified minutely areolar," leads me to the conclusion that the species which Dr. Johnston described in 1848 as *Hydrachna naïca*, is no other than the *Nesæa reticulata* which Kramer described in 1879—*Hygrobatæ reticulatus* P. Kram. of later writers.

This being so, the law of priority as set out in Article 25 of the International Rules of Nomenclature comes into operation. The name of the species must in future be *Hygrobatæ naïcus* (Johnston), with *H. reticulatus* P. Kram. as synonym.

4 MEADOWBANK TERRACE, EDINBURGH.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND
FERNS FOUND AT A THOUSAND METRES AND
UPWARDS ON THE MOUNTAINS OF THE BRITISH
ISLES, WITH AUTHENTIC REFERENCES AND CRITICAL NOTES.

By FREDERIC N. WILLIAMS, F.L.S.

(Continued from p. 251, No. 68, Oct. 1908.)

Fam. 18. CRUCIFLORACEÆ.

45. *Draba rupestris*, Aiton.—In crevices on alpine rocks, up to the summit of Ben Lawers ("Fl. Perthsh." 64). "Near the top and on the summit of Ben Lawers" (R. Brown, 1793, in Herb. Brit.). First found by James Dickson in 1789 on Ben Lawers ("Trans. Linn. Soc." ii. 288 [1790]). On rocks near the summit of Ben Lawers (G. Don). Summit of Ben Lawers (Wm. Christy, 1829, in Herb. Brit.), and within 10-12 feet of the top (G. C. Druce). Ben Dothaidh, above 915 m. very scarce (E. S. Marshall, 1893, in Herb. Brit.). Rocks at the summit of Cairn Gorm (Hook. "Fl. Scotica," 1821, 197; Hook. et Arn. "Brit. Flora," ed. 8, 1860, 31).

46. *Draba incana*, L.—On alpine rocks in the Breadalbane district from 518-1082 m. ("Fl. Perthsh." 65). "My specimens were collected from Ben Lawers," (G. Don, fasc. viii. 1806, n. 187). Descends to sea-level in Londonderry.

47. *Cardamine flexuosa*, With.—Ascends to 1190 m. on Ben Lawers ("Fl. Perthsh."), in damp places. Descends to sea-level in Dublin.

48. *Cardamine hirsuta*, L.—Ascends to 1160 m. in the Breadalbane district ("Fl. Perthsh." 62), on bare ground. Descends to sea-level in Cork.

49. *Cochlearia micacea*, E. S. Marshall in "Journ. Bot." 1894, p. 289, tt. 345, 346.—Radix perennis. Rhizoma crassum lignescens foliorum vetustorum vestigiis cicatricosum. Frondatio¹ orobitino-nitida, coriacea. Folia primordialia subintegra, tenuiter cordata; plantæ floriferæ plerumque parva, 4-6 mm. lata, plana vel leviter concava, venis paucis inconspicuis, petiolis tenuibus canaliculatis 8-25 mm. longis suffulta, orbicularia vel deltoideo-reniformia, integra vel leviter denticulata. Folia caulina plus minus denticulata angulata; inferiora petiolata, superiora sessilia amplexicaulia; auriculæ parvæ acutæ vel nullæ. Caules floriferi crebri, simplices vel ramosi, primum breves compacti, dein elongati, erecti vel adscendentes. Sepala ovato-lanceolata obtusa cucullata, extus apice rubella. Petala speciosa alba nivea; limbus oblongus, in unguem dimidio brevior abrupte contractus. Racemi fructiferi sæpe elongati. Siliqua matura venis elevato-reticulatis carens, basi apiceque angustata, ambitu late ovato-lanceolata ad lineari-lanceolatam, formâ longiore sæpe ad faciem interiorem complanata (ut videtur falcata vel zizyphomorpha²), pedicello patente vel adscendente æquilongo suffulta. Stylus distinctus, sat longus. Septum haud fenestrellatum. Semina in quaque siliqua 2-6 (sæpius 4), magna fusca late ovoidea, tuberculis rotundatis brevibus vel rugis vestita.

Hab.—Ben Lawers, from 1070 to 1130 m. Ben Ein, from 976 to 1070 m. Ben Dothaidh, above 915 m. Specimens from all three mountains in Herb. Brit. Ben Lawers (E. S. Marshall, 1887, n. 199, n. 894, 1891, n. 84, C. P. Hurst, 1906). Ben Ein (E. S. Marshall, 1889, n. 198). Ben Dothaidh (E. S. Marshall, 1893, n. 1012). The long-fruited form mentioned in the description was found by Messrs. Marshall and Hanbury on Ben Ein. The reference-numbers are taken from the type-specimens, and are not cited by Mr. Marshall in his English description of the plant.

Mr. Marshall also states on the label that his plant proved distinct from *C. alpina* and *C. danica* by five years' cultivation. In all three stations it grows in company with *Cerastium arcticum*, and may be presumed to belong to a dying-out arctic vegetation. Mr. Marshall also identifies with this plant an example of *C. alpina* in Herb. Kew. gathered by H. C. Watson near the summit of Ben Lawers in 1832.

¹ A new term proposed for the general foliage.

² A new term proposed for "jube-shaped."

50. *Cochlearia arctica*, Schlecht.—Mr. Marshall thinks it possible that a peculiar smooth-podded plant found on the upper part of Ben Lawers might be referred to this species, but its admission to the British list is not yet sufficiently definite.

51. *Cochlearia alpina*, Watson.—Ascends to 1175 m. on the mountains of the Breadalbane district, and probably rarely descends below 610 m.,—a plant of alpine springs, rills, and wet rocks ("Fl. Perthsh." 66). On Ben Ein up to about 1070 m. (E. S. Marshall and F. J. Hanbury). Ben Ein (E. S. Marshall, 1889, in Herb. Brit.). Ben Lawers (Herb. Kew. and C. P. Hurst, 1906, in Herb. Brit.—but no height given on either specimen). Ben Lawers (W. Gardiner, 1842, in Herb. Brit.). Stob-Coire-an-Easain, Glen Nevis, at 1037 m. (E. S. Marshall, 1896, in Herb. Brit.). Top of Ben Lawers (J. Carroll, 1864, in Herb. Brit.). On all the damp ledges of rocks on Snowdon and Carnedd Llewelyn (Banks's herb. 1773, in Herb. Brit.).

52. *Cochlearia grænlandica*, L.—Ben Ein, from 1006 to 1070 m., also on Ben Lawers, at a high level (E. S. Marshall and F. J. Hanbury). For a critical note on this plant by Mr. Marshall, and the only good figure which has been made of it, see "Journ. Bot." 1892, p. 225, t. 326 a, where the writer states that he suspects it is often biennial.

Fam. 19. RANUNCULACEÆ.

53. *Thalictrum alpinum*, L.—Alpine rock ledges up to the summit of Ben Lawers ("Fl. Perthsh." 45). "Ben Lawers in Breadalbane" (R. Brown, 1794, in Herb. Brit.). Within 10-12 feet of the top of Ben Lawers (G. C. Druce). Descends to 274 m. in Donegal.

54. *Ranunculus acer*, L.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 51). "At considerable heights on Ben Lawers, Breadalbane" (R. Brown, 1794, in Herb. Brit.). Ascends almost to the summit of Ben Lawers ("Cyb. Brit." i. 87). Ben Nevis, at 1026 m. (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]), and at 1100 m. and upwards ("Cyb. Brit." i. 87). Cairn Toul, at 1067 m. (F. J. Hanbury, 1887, ex "Journ. Bot." 1890, 180). Descends to sea-level in Cork.

f. *Nathorstii*, G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 166.—Up to 1070 m. on Ben Lawers.

f. *humilis*, G. C. Druce in "Ann. Scot. Nat. Hist." 1904, 115.—At 1037 m. on Ben Dearg, in Ross-shire.

Var. *pumilus*, Wahlenb. "Fl. Lapponica," 159.—Corrie Sneachda, on the northern side of Cairn Gorm, from 854 to 1068 m. (G. C. Druce in "Journ. Bot." 1889, 204).

55. *Caltha palustris*, L.—At 1000 m. on Ben Macdhui (E. G.

Baker, 1893, in Herb. Brit.). At 1100 m. on Braeriach (*Dr. J. W. H. Trail*, 1902). Ascends to 1067 m. on Ben Macdhuì (R. Mackay *ex* Dickie, p. 4); and to 1100 m. on Loch-na-gar (F. B. White.) Descends to sea-level in Cork.

Fam. 20. ROSACEÆ.

56. *Alchimilla vulgaris*, L.—Most commonly almost quite glabrous, but not unfrequently hairy all over, even to the calyx. Ascends to the summit of Ben Lawers ("Fl. Perthsh." 131). Ascends to 1037 m. on Ben-na-Bourd (Watson, 1844); and to 1100 m. elsewhere on the Grampians of Aberdeenshire (Watson). Descends to sea-level in Londonderry.

57. *Alchimilla alpina*, L.—On alpine pastures up to the summit of Ben Lawers ("Fl. Perthsh." 131). Ascends to 1220 m. on Ben Nevis, and nearly to the summit of Ben Macdhuì (Watson, "Outlines Geograph. Distrib. British Plants," 1832, p. 142), and to 1130 m. on the table-top of Ben-na-Bourd (Watson, 1832, in herb.). Ascends to 1271 m. on Ben Macdhuì (Dickie, 51). Descends to 610 m. on Thonalagee Hill, Wicklow.

58. *Sibbaldia procumbens*, L.—In Perthshire the plant is found in rather bare places on the higher mountains, from 518 m. in the Atholl district to 1122 m. in the Breadalbane district, and high up on Ben More (Lightfoot, "Fl. Scotica," 175). In Inverness-shire ascends to the summit of Ben Alder (F. B. White), and to 1220 m. on Ben Nevis (Watson, "Outlines Geograph. Distrib. British Plants," 1832, p. 141). In Aberdeenshire ascends to 1250 m. on Ben Macdhuì (R. Mackay *ex* Dickie, 52), and in great profusion on the higher mountains, such as on Ben-na-Bourd up to 1037 m. (Watson, 1844). "On the summits of the Highland mountains of Scotland, in a micaceous soil, plentiful" (Smith, "English Fl." ii. 121). Under the name of "*Fragariæ sylvestris affinis planta, flore luteo*" first recorded as a British plant in 1684 by Sir R. Sibbald ("Scotia Illustrata," ii. p. 25, t. 6, f. 1); "transmissa fuit ad Hortum Medicum a regione *dermensi* ubi in sylvis sponte provenit." Also figured later by Petiver under the name of "Scotch Cinquefoil." There are examples from Ben Lawers in Herb. Brit., but no height is given. It is rather local on the mountains of Perthshire.

59. *Potentilla rubens*, Vill.—Ascends to 1022 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 129). Ben Lawers (R. Brown, 1793, as *P. opaca*, and J. L. Knapp, 1830, as *P. alpestris*, in Herb. Brit., but no heights given).

60. *Potentilla erecta*, Hampe. in Linnæa, xi. 50 (1837).—Ascends to 1006 m. on Ben-na-Bourd (Dickie, 51). Descends to sea-level in Cork.

61. *Rubus chamæmorus*, L.—Ascends to 1067 m. on the mountains of the Rannoch district, in peaty places (“Fl. Perthsh.” 124). “Upon the mountains about Loch Rannoch” (Lightfoot, “Fl. Scotica,” 266). Ascends to the summit of Glas Maol, on the Aberdeenshire side (J. Barton, 1859, in Herb. Brit. *ex* herb. Trimen); and to 1160 m. on Ben-na-Bourd (F. B. White in “Scot. Nat.” i. 119 [1871]).

Fam. 21. ONOTHERACEÆ.

62. *Epilobium alpinum*, L.—Ascends to 1190 m. on Ben Lawers, by alpine springs, rills, and damp places (F. B. White). “Found near the snow upon Ben More in Breadalbane, July 2, 1771; more than 2500 feet above the sea” (Wm. MacRitchie, in Herb. Brit.). “Tops of the hills between the head of Clova and Invercauld in Aberdeenshire” (R. Brown, 1794, in Herb. Brit.).

63. *Epilobium alsinifolium*, Vill.—Ascends to 1037 m. on the mountains of the Breadalbane district, as on Ben Lawers,—“in little rills at very great heights east side of Ben Lawers” (R. Brown, 1794, in Herb. Brit.); in or near alpine and subalpine rills and streams, or among damp rocks, but not very common. “This species seems not to descend along the rivers, like some other mountain plants, to any great extent” (“Fl. Perthsh.” 156). On the margins of alpine rivulets high up on Ben Nevis (Alexander Murray, about 1820). Descends to 305 m. on the limestone cliffs of Glenade, in Leitrim, growing in the springs and at the foot of small trickling waterfalls, just sufficient to keep the rocks thoroughly wet (Barrington and Powell, in “Journ. Bot.” 1884, 247); the only locality known for this plant in Ireland.

Fam. 22. SAXIFRAGACEÆ.

64. *Saxifraga autumnalis*, L.—Common in the Highland area. Ascends to 1175 m. on Ben Lawers in marshy places, chiefly alpine and subalpine. Sides of rills on Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). This name does not seem to have been taken up in English floras. Whether *S. autumnalis*, L., is conspecific with *S. aizoides*, L., I cannot say, but *S. autumnalis* is the earlier name of the two (for those who insist on actual priority); and all the Scottish alpine examples under the name of *S. aizoides* which I have examined agree with the Linnean description of *S. autumnalis*, and not with that of *S. aizoides*—the differential characters of the form and margin of the leaves are very obvious. I may also point out that specimens named *aizoides* in the Linnean Herbarium also obviously belong to *S. autumnalis*. This, however, counts for little, as Linnæus was notoriously indifferent to the critical naming of specimens in his herbarium, and based his species mainly on

descriptions and previous synonyms, not on individual plants. In compiling his systematic works be made abundant use of the descriptions of his predecessors. In the habitat of *S. aizoides* Linnæus gives "In Alpibus . . . Westmorlandicis," in that of *S. autumnalis* he gives "In humentibus . . . Angliæ." In "Mant. Plant." ii. 383, Linnæus cites Haller's view as to the status of *S. autumnalis*:—"Dubitat nunc, utrum sit vere specie distincta a *S. aizoides*, cum Jacquino, Hallerus."

65. *Saxifraga hypnoides*, L.—Common on the Highland mountains; on alpine and subalpine stony places and rock ledges. Ascends to the summit of Ben Lawers ("Fl. Perthsh." 142). Ben Lawers (J. Carroll, 1864, in Herb. Brit.). The type (var. *gemmifera*, Ser., ap. Cand. Prodr. iv. 31) is apparently confined to the limestone and basalt; and descends to sea-level in Clare.

66. *Saxifraga quinquefida*, Haworth, "Miscell. Nat." 163 (1803).—Ben Lawers (G. C. Druce, specimen named by Prof. Engler).

67. *Saxifraga grænlantica*, L.—Near the summit of Ben Lawers (G. C. Druce in "Ann. Scot. Nat. Hist." 1898, p. 243). If this plant is considered conspecific with *S. hypnoides*, then *grænlantica* is the earlier name of the two. There is no specimen under this name in Herb. Linn.

68. *Saxifraga oppositifolia*, L.—On rocky alpine places ascends to the summit of Ben Lawers, and descends to 366 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 144). Summit of Ben Lawers (Watson, 1832, in Herb. Kew.). Ben Lawers (G. Don, Fasc. iii. 1805, n. 57). Ben More (Watson, 1830, in Herb. Kew. but no height given). Descends to sea-level in Donegal.

69. *Saxifraga sponhemica*, C. G. Gmelin.—Rather common on the alpine rocks of the Snowdon range, and first recorded from here as a Welsh plant in 1821, though not under this name (P. B. Williams, "Tourist's Guide through the County of Carnarvon"). It is the plant referred to by Smith in "Engl. Flora," ii. 278:—"Mr. Griffith has favoured me with an alpine Welsh specimen, answering to Mr. Don's account of his *condensata*, but I cannot consider it as a distinct species. Whether it be Gmelin's plant, I have had no opportunity of ascertaining." Gmelin figures *S. condensata* in "Fl. Badens." ii. p. 226, t. 3, but it does not seem possible to separate the two plants by any definite characters, and *S. sponhemica* is the earlier name. There is a specimen labelled *Saxifraga cæspitosa* in Herb. Soc. Linn. gathered by J. W. Griffith, in which the calyx-lobes are lanceolate and acute (not obtuse), which may be this, from Idwal lake. Summit of Snowdon (R. N. Streeten, 1839, in herb. Watson); this specimen exactly agrees with the description

and authentic examples of *S. sponhemica*. A very protean species : a form approaching *S. cæspitosa*, from Ben More, at 1000 m., is a bright green, densely tufted plant, with shorter scapes, and broader yellower petals than usual (E. S. Marshall, in "Journ. Bot." 1889, 231.

(To be continued.)

PLANTS OF THE FAROE ISLES NOT OCCURRING IN GREAT BRITAIN, AND OTHERS NOT OCCURRING IN SHETLAND, ORKNEY, CAITHNESS, OR THE OUTER HEBRIDES.

By ARTHUR BENNETT.

THE full lists of plants of the Faroes given by Mr. C. H. Ostenfeld¹ enables me to compare the species wanting in the northern islands and the extreme north of Scotland.

I. FAROESE SPECIES NOT OCCURRING IN GREAT BRITAIN.

<i>Ranunculus glacialis</i> , <i>L.</i>	<i>Epilobium lactiflorum</i> , <i>Hausskn.</i>
<i>Papaver radiculatum</i> , <i>Rottb.</i>	<i>Archangelica officinalis</i> , <i>L.</i>
<i>Draba hirta</i> , <i>L.</i>	<i>Salix glauca</i> , <i>L.</i>
<i>Koenigia islandica</i> , <i>L.</i>	<i>Carex Lyngbyei</i> , <i>Hornem.</i>

And twenty-one named Hieracea, all of which are said to be endemic in the Faroes.

2. SPECIES OCCURRING IN THE FAROES, BUT ABSENT FROM ONE OR MORE OF THE VICE-COUNTIES—SHETLANDS (1), ORKNEYS (2), CAITHNESS (3), OUTER HEBRIDES (4).

Absence from any of these is denoted by the relative numeral. Many of the species occur in Iceland, and are marked I.

<i>Ranunculus auricomus</i>	—	I	2	3	4
<i>R. reptans</i>	I.	I	2	3	4
<i>Arabis petræa</i>	I.	—	2	3	—
<i>Subularia aquatica</i>	I.	—	2	—	—
<i>Sagina nivalis</i>	I.	I	2	3	4
<i>S. subulata</i>	I.	—	2	3	4
<i>Cerastium Edmonstonii</i>	I.	—	2	3	4

¹ "Botany of the Faroes, Additions and Corrections," 835-863, 1907.
 "Land-Vegetation of the Faroes," 896-902, 1908.

<i>C. trigynum</i>	I.	1	2	3	4
<i>Arenaria rubella</i>	I.	—	2	3	4
<i>Hypericum quadrangulum</i>	—	1	2	—	4
<i>Geranium sylvaticum</i>	I.	1	—	—	4
<i>Montia lamprosperma</i>	—	1 (?)	—	3	4
<i>Rosa mollis</i>	—	1	—	—	—
<i>Alchemilla filicaulis</i>	I.	—	—	3	4
<i>Potentilla verna</i>	I.	1	2	3	4
<i>Sibbaldia procumbens</i>	I.	—	2	3	4
<i>Dryas octopetala</i>	I.	1	—	3 (?)	4
<i>Sedum villosum</i>	I.	1	2	3	4
<i>Saxifraga cæspitosa</i>	I.	1	2	3	4
<i>S. hypnoides</i>	I.	1	—	—	4
<i>S. nivalis</i>	I.	1	2	3	4
<i>S. rivularis</i>	I.	1	2	3	4
<i>S. stellaris</i>	I.	1	2	—	—
<i>Callitriche hamulata</i>	I.	1	2	—	—
<i>C. stagnalis</i>	I.	1	2	—	—
<i>Epilobium alsinifolium</i>	I.	—	2	3	4
<i>E. anagallidifolium</i>	I.	1	2	3	—
<i>Cornus suecica</i>	I.	—	—	3	4
<i>Gnaphalium supinum</i>	I.	1	[2]	3	4
<i>Matricaria phaeocephala</i>	I.	—	2	—	—
<i>Taraxacum spectabile</i> , Dahlst	—	—	2	3	4
<i>Campanula rotundifolia</i>	I.	—	2	—	—
<i>Pyrola minor</i>	I.	1	2	3	4
<i>Lysimachia nemorum</i>	—	1	—	—	—
<i>Myosotis palustris</i>	—	1	—	—	4
<i>Veronica alpina</i>	I.	1	2	3	4
<i>V. fruticans</i>	I.	1	2	3	4
<i>Bartsia alpina</i>	I.	1	2	3	4
<i>Rhinanthus groenlandicus</i>	—	—	2	3	4
<i>R. pubescens</i>	—	1	2	3	4
<i>R. fallax</i>	—	1	2	3	—
<i>Euphrasia borealis</i>	—	—	2	—	—
<i>Salix phylicifolia</i>	I.	1	—	—	4
<i>Malaxis paludosa</i>	—	1	2	3	—
<i>Tofieldia palustris</i>	I.	1	2	—	4
<i>Potamogeton alpinus</i>	I.	1	2	—	4
<i>P. prælongus</i>	—	1	2	—	4
<i>Juncus balticus</i>	I.	1	2	—	—
<i>J. biglumis</i>	I.	1	2	3	4
<i>J. obtusiflorus</i>	—	1	2	3	4
<i>J. triglumis</i>	I.	—	2	3	4
<i>Luzula spicata</i>	I.	—	2	—	—
<i>L. arcuata</i>	I.	1	2	3	4

Carex atrata	I.	1	2	3	4
C. pulla	I.	1	2	3	4
C. rigida	I.	—	2	—	—
C. salina	I.	1	2	—	4
Poa alpina	I.	1	2	3	4
P. glauca	I.	1	2	3	4
P. nemoralis	I.	1	2	3	4
Aira alpina	I.	1	[2]	3	4
Agropyrum junceum	—	1	—	—	—
Polystichum Lonchitis	—	1	—	—	4
Phegopteris Dryopteris	I.	—	2	—	—
Equisetum pratense	I.	—	2	—	—
Lycopodium annotinum	I.	1	—	—	—
Isoetes echinosporum	I.	—	2	3	—

23 are not found in any of the four Scottish vice-counties.

17	“	“	three	“	“
14	“	“	two	“	“
11	“	“	one	“	“

Ranunculus auricomus, *L.* — Watson observes on this¹ “there seems no climatic cause to prevent its occurrence in the West and North Highlands.” In Arctic Norway it extends to $71^{\circ} 8'$, and altitude 1440 feet; in Sweden to 68° N.; and from Skåne to Swedish Lapland its distribution is continuous; in Russian Lapland to 69° . Of the 23 above species, *Sedum villosum*, *Pyrola minor*, and *Juncus obtusiflorus*, seem the most likely to occur in one or more of the four vice-counties named. Of those absent from three—*Hypericum quadrangulum*, *Rhinanthus granlandicus*, *Juncus triglumis*, and *Poa nemoralis* are most likely to occur in some one or more of the three; of those absent from two *Sagina subulata*, *Geranium sylvaticum*, *Alchemilla filicaulis*, the two *Callitriches*, *Salix phylicifolia*, and *Isoetes echinosporum*; of those absent from one *Subularia aquatica*, *Campanula rotundifolia*, *Euphrasia borealis*, *Luzula spicata*, and *Phegopteris Dryopteris*.

Polygala vulgaris, var. *Ballii*, is given as in the Faroes; but the specimens sent me so named are certainly not the same as the Irish plant.

Alsine (*Arenaria*) *hirta*, *Hartm.* — Mr. Beeby² says Dr. Lange considered the Ben Lawers ‘*rubella*’ “a compact form of *A. verna*, var. *hirta*.” Hooker³ gives it as *A. hirta*, Wormsk., with the syn. of ‘*A. rubella*, Hook.’ Wormskiold published it in “Flora Danica,” F. 38, t. 1646, 1819, edited by J. W.

¹ “Cyb. Brit.” i. (1847), p. 87.

² “Scot. Naturalist,” (1888), p. 209.

³ “Stud. Fl.” ed. 3 (1884), p. 63.

Hornemann. Of course if placed under *Arenaria* the name *rubella* (published in Parry's "Second Voyage") is later than that of "Fl. Danica."

Summing up the numbers, there are in the Faroes but not in Shetland 49, not in Orkney 53, not in Caithness 41, and not in the Outer Hebrides 43.

Comparing the altitudes in the Faroes and in Scotland:—

Sagina nivalis.—Rocky flat, Bordö, at 600 m. Lowest altitude in Scotland, 3100 feet.

Cerastium trigynum, about 2200 feet. Scotland, 2700 feet.

"*Potentilla verna*, *L.* (*P. maculata*, Pourr.)."—No definite height given. Scotland down to 400 feet.

Sedum villosum.—"Both in the mountain-plateaux and the lower regions." Scotland down to 50 feet or less. N. England 600 feet.

Saxifraga cæspitosa.—In the Faroes this is found not only on the mountains but on the lower regions, and in Iceland it descends to sea-level, while in Scotland it is one of the species found only above 2000 feet.

Saxifraga nivalis.—"Sub-alpine latitude, *i.e.* lower regions, and exceptionally on the mountain-plateaux." 1300 feet in Bordö. In Scotland, 1200 feet Skye (Roy); Perth, probably at under 2000 feet (White); 1500 feet in Westmoreland (Baker). This shows, as with *cæspitosa*, the difference between Faroe and Scotland.

Saxifraga rivularis.—Only on the mountain-plateaux. In Scotland I can find no record below 2700 feet.

Pyrola minor.—1270 feet, associated with *Silene acaulis*, *Luzula spicata*, *Alchemilla alpina*, and *Sibbaldia*, "an extremely peculiar habitat for the plant."¹ In Scotland it grows up to 2900 feet (Marshall), and 3700 feet (White).

Veronica alpina.—Mountain-plateaux only. Down to 1200 feet in Perth (White).

Veronica fruticans.—Mountain-plateaux only. Down to 1200 feet in Perth (White).

Bartsia alpina.—Mountain-plateaux only. England, Humber 900 feet (Watson). Scotland, in Perth at 1600 feet (White).

Juncus biglumis.—At 1140 feet and 2000 feet. Scotland, at 2500 feet in Perth (White); "down to 2000 feet" (Dickie).

Luzula arcuata.—Mountain-plateaux only. In Scotland, Aberdeen and Easternness at 3000 feet.

¹ Ostenfeld, *l.c.* 999.



Carex atrata.—Mountain-plateaux only. 1600 feet in Perth (White) is lowest I can find.

Carex pulla.—1170 feet, 1300 feet, 1610 feet (Faroe). 2200 feet in Perth (White).

Poa alpina.—Mountain-plateaux, and occasionally descending lower. 1000 feet in Perth.

Poa glauca.—Found in the lower regions and in the mountain-plateaux. Scotland, descending to 400 feet ("Fl. Perth," p. 352).

Of these plants that do not occur in the four most northern vice-counties of Scotland, the most remarkable as occurring in the Faroes are *Sagina nivalis*, *Cerastium trigynum*, *Saxifraga cæspitosa*, *S. rivularis*, *Juncus bighmis*, and *Luzula arcuata*. These are species in Scotland not recorded from below 2000–2500 feet; and though there are hills above 2000 feet in Caithness and the Outer Hebrides they are nowhere recorded from them. It may seem that the geological formation may have something to do with this, as it is absolutely of one formation, or the products of it, in the Faroes.

ALIEN PLANTS.

By JAMES FRASER.

THE following list consists mainly of Alien Plants seen during 1908, but a few of them, observed during the three or four preceding years, have only now been identified.

In August last, under the guidance of Miss Hayward of Galashiels, the banks of the river Tweed from Abbotsford to Leaderfoot were examined for alien plants, and about one hundred and twenty species were observed, nearly all wool and hide introductions which escaped from the mills on the Gala, the Ettrick, and the Tweed. Many of them are natives of Australia, the Cape, the Argentine, and Chili, and had not previously been found in Britain.

As in previous papers, the following names under each Natural Order are arranged in rough alphabetical order: an asterisk *in front* of a name indicates a new British record: α = once found; β = twice or thrice, but rare; γ = neither rare nor frequent; δ = frequent; ϵ = abundant: the name

"Tweed" indicates those observed on the shingle of that river between Abbotsford and Leaderfoot.

CRUCIFERÆ.

- Barbarea arcuata*, *Reichb.* Leith, *a.*
B. sicula, *Presl.* Leith, *a.*
Eruca vesicaria, *Cav.* Leith, *ε.*
Erysimum Perofskianum, *Fisch. and Mey.* Leith, *γ.*
Iberis sempervirens, *L.* Leith, *a.*
Malcolmia maritima, *R. Br.* Leith, *β.*
Nasturtium amphibium, *Br.* Leith, *γ.*
Sisymbrium runcinatum, *Lag.* Leith, *a.*

MALVACEÆ.

- Lavatera trimestris*, *L.* Leith, *γ.*

AMPELIDEÆ.

- Vitis hederacea*, *Ehrh.* Slateford (outcast), *γ.*

RUTACEÆ.

- Ruta graveolens*, *L.* Leith, *a.*

LEGUMINOSÆ.

- **Astragalus hispidulus*, *DC.* Leith, *ε.*
 **A. Stella*, *Gouan.* Leith, *γ.*
 **Lupinus linifolius*, *Roth.* Slateford and Leith, *β.*
Medicago laciniata, *Mill.* Leith and "Tweed," *γ.*
 **M. coronata*, *Desr.* Leith, *a.*
Ononis reclinata, *L.* Leith, *β.*
Trifolium angustifolium, *L.* Leith and "Tweed," *β.*
T. stellatum, *L.* Leith, *β.*
T. glomeratum, *L.* "Tweed," *a.*

LYTHRACEÆ.

- Lythrum Hyssopifolia*, *L.* Leith and "Tweed," *γ.*

UMBELLIFERÆ.

- **Astrantia helleborifolia*, *Salisb.* In a wood in Linlithgowshire, *β.*
Bupleurum aristatum, *Bartl.* Leith, *β.*
Trinia vulgaris, *DC.* Leith, *a.*

DIPSACEÆ.

Cephalaria transylvanica, *Schrad.* Leith, β .

COMPOSITÆ.

Artemisia Dracunculus, *L.* Leith, β .

Anacyclus clavatus, *Pers.* Leith, β .

A. valentinus, *L.* Leith, β .

Bidens tripartitus, *L.* "Tweed," α .

Cirsium oleraceum, *Scop.* Near Selkirk, β .

Calotis hispidula, *F. von Muell.* "Tweed," δ . A native of Australia.

Cotula coronopifolia, *L.* "Tweed," γ .

**C. australis*, *Hook. f.* "Tweed," α .

**C. integrifolia*, *Hook. f.* Leith, β .

Cenia turbinata, *Pers.* "Tweed," α . A native of the Cape.

Gnaphalium luteo-album, *L.* "Tweed," α .

Grindelia squarrosa, *Dunal.* Leith, β .

Guizotia abyssinica, *Cass.* Leith and "Tweed," δ .

Hypochaeris glabra, *L.* "Tweed," γ .

Helipterum corymbiflorum, *Schlecht.* "Tweed," α . A native of Australia.

Helianthus Maximiliani, *Schrad.* Leith, β .

**Rhagadiolus hedypnois*, *L.* Leith, α .

Erigeron acre, *L.* "Tweed," β .

Madia sativa, *Molina.* "Tweed," γ .

Senecio lautus, *Forst.* "Tweed," γ . A native of Australia.

S. brachyglossus, *F. von Muell.* "Tweed," γ . A native of Australia.

S. subdentatus, *Ledeb.* Leith, α .

BORAGINACEÆ.

Anchusa hybrida, *Ten.* Leith, β .

Borago officinalis, *L.* Leith, β .

Echinospermum deflexum, *Lehm.* Leith, β .

SOLANACEÆ.

Datura Stramonium, *L.* One plant by the Esk, above Musselburgh in July 1907.

SCROPHULARIACEÆ

Linaria spuria, *Mill.* Leith, α .

LABIATÆ.

- **Nepeta nuda*, *L.* Leith, *a.*
Marrubium Alysson, *L.* Leith, *β.*
Salvia controversa, *Ten.* Leith, *a.*

PLUMBAGINACEÆ.

- Statice Suworowi*, *Regel.* A fine clump, on a rubbish heap near Slateford (outcast).

ILLECEBRACEÆ.

- **Paronychia bonariensis*, *DC.* "Tweed," *a.* A native of the Argentine.
Herniaria cinerea, *DC.* Leith, *β.*

AMARANTACEÆ.

- Amaranthus caudatus*, *L.* Leith and near Slateford, *β.*
Celosia cristata, *L.* Near Slateford, *β.* (outcast or escape).

CHENOPODIACEÆ.

- Atriplex spongiosa*, *F. von Muell.* "Tweed," *δ.* A native of Australia.
Atriplex rosea, *L.* Near Musselburgh, *γ.*
Chenopodium ambrosioides, *L.* Leith and "Tweed," *a.*
C. opulifolium, *Schrad.* Leith, *a.*
Suaeda altissima, *Pall.* Leith, *γ.* These plants appeared yearly for three or four years, but never flowered till this year.

POLYGONACEÆ.

- Rumex Brownii*, *Campd.* "Tweed," *δ.* A native of Australia.

EUPHORBIACEÆ.

- Euphorbia platyphyllos*, *L.* Leith, *β.*

IRIDACEÆ.

- Tritonia crocosmiflora*. One plant by the Esk above Musselburgh, in September 1907. (Outcast, side by side with *Tellima grandiflora*.)

LILIACEÆ.

- Smilacina stellata*, *Desf.* In a wood in Linlithgowshire, plentiful.

GRAMINEÆ.

- **Agrostis retrofracta*, Willd. Several plants of this Australian grass were gathered by Miss Hayward and myself on the Tweed shingle between Galafoot and Melrose. We are indebted to Professor Hackel for its identification.
- Agrostis scabra*, Willd. (*Agrostis hyemalis*, B.S.P.). This plant Mr. M'Andrew gathered in Leith, in 1904, and meagre specimens were seen in each of the following years till 1908, when good, healthy plants were found. We are indebted to Professor Hackel for its determination.
- Agrostis verticillata*, Vill. "Tweed," a.
- Avena orientalis*, Schreber. Plentiful at Leith.
- Bromus brizæformis*, Fisch. and Mey. Several plants at Gorgie and Leith.
- Bromus hordeaceus*, L., var. β *leptostachys*, Beck. Identified by Professor Hackel. Plentiful at Leith.
- **Hordeum chilense*, Brong. A single plant, Leith. Identified by Professor Hackel.
- H. bulbosum*, L. (*H. strictum*, Desf.). Two fine clumps at Slateford.
- Phleum exaratum*, Hochst. ? A single plant, Leith. Of this plant Professor Hackel has some doubt. It comes very near *P. exaratum*, Hochst, a species closely allied to *P. græcum*, if not a variety of it. He writes, "Your specimen is in a young state, and shows not the characteristic thickened side and marginal nerves, between which there is a furrow ('glumis exaratis,' Boissier) in the more advanced state which Boissier described." In all other respects my plant agrees with *P. exaratum*.
- **Phalaris angusta*, Nees. Several fine plants at Leith.
- Setaria viridis*, Beauv. var. *majus*, Gaud. Several at Leith.
- **Trisetum Cavanillesii*, Trin. One plant, Leith.
- **Sphenopus divaricatus*, Reichb. A single plant, Leith. Identified by Professor Hackel.
- **Triticum triaristatum*, G. and G. var. *macrochaetum*, Hackel. (*Ægilops macrochaeta*, Shuttl. and Huet.). A fine clump at Leith.
- **T. triaristatum*, G. and G. "A form intermediate between the type and the var. *macrochaetum*." Several plants at Leith and Slateford. For the identification of the above two grasses I am indebted to Professor Hackel.
- **T. ventricosum*, Ces. Very plentiful at Leith, Gorgie, and Slateford.

THRINCIA NUDICAULIS, BRITT., IN
PERTSHIRE.

By WILLIAM BARCLAY.

IN August last Mr. David Campbell, a keen botanist and one of the most promising recruits of the P.S.N.S., brought me a specimen of *Thrinicia nudicaulis*, Britt., which he had found by the roadside at the policies of Dupplin Castle. He recognised the plant from having seen it in Haddingtonshire, where it occurs in various places in considerable quantity. On visiting the station at Dupplin I found the plant growing in patches along one side of the road, at the base of the boundary wall, for a distance of about a hundred yards or more. It was not to be found on the other side of the road.

In Dr. White's "Flora of Perthshire," under its synonym *Leontodon hirtus*, two old records are given. One "in a field below the garden at the Earl of Kinnoull's seat near Perth (Mr. Miller in Smith's 'Fl. Brit.,' 1800) has not been verified." The other, "Steirck-an-Lochan, Ben Lawers" (W. Gardiner, 1842), is probably an error.

On reading this, one would suppose that Mr. Campbell's discovery was simply a verification of the first of these old records, for Mr. Miller's station, as given in the "Fl. Brit.," is almost the same as Mr. Campbell's. But on referring to the "Flora Britannica" itself, I found, to my surprise, that there is no such record in that work. There the plant is given under the name *Hedypnois hirta*, with amongst other synonyms *Leontodon hirtum*, Lin., but no localities are mentioned except "in pascuis et ericetis glareosis." After some trouble, however, I found the key to the mystery. In the "Addenda et corrigenda" to Smith's work, at page 1401, No. 684, we read: "*Thlaspi hirtum*. In a field below the garden at the Earl of Kinnoull's seat near Perth." In the "English Flora" of the same author (1825), vol. iii. page 167, *Lepidium hirtum*, the *Thlaspi hirtum* of the Flora, is stated to occur "in Perthshire, near the seat of the Earl of Kinnoull.

Mr. Miller and Mr. J. Mackay." This is evidently a mere repetition of the former record.

It is easy now to see how the mistake arose. In making out a list of records of Perthshire plants from the "Fl. Britt.," which he would do when he first began the work of compiling a county Flora, Dr. White had copied the record correctly enough, but had written *L. hirtum* for *Lepidium hirtum*, the new name of *Thlaspi hirtum*. But in reading his own note, probably many years afterwards, he would naturally conclude that *L. hirtum* stood for *Leontodon hirtum*, a plant which he had never been able to find in the county, instead of *Lepidium hirtum*, quite a common plant in many parts of Perthshire. Besides, by that time he would have got into the habit of thinking of the latter plant as *Lepidium Smithii*, Hook., as given in the 8th edition of Babington's "Manual," the Flora which he always carried with him for reference.

It is certainly a singular coincidence that the new discovery should have been made so close to the place pointed out in the old erroneous record. There can, however, in my opinion be no doubt that Mr. Campbell is the first who has really found the plant in Perthshire. But the question arises, Is the plant really native, or has it been purposely or accidentally introduced through the agency of man? There is not the slightest ground for supposing that it has been purposely introduced, and I am unable to conceive in what way it could have come there indirectly and unintentionally through man's agency. On the other hand it may be asked, Is it possible to believe that it could have been in its present station for a lengthened period, and have escaped notice until now? Such cases have happened, and I could give more than one instance of a plant, by no means very inconspicuous, which was overlooked for a long series of years, although competent botanists must have walked scores of times past the spot where it was growing.

The question, therefore, is one which it is not easy to decide, or rather it is one to which it is impossible to give an absolutely certain reply. At present I incline to believe that the plant has not come to Mr. Campbell's station through the agency of man.

ZOOLOGICAL NOTES.

The Late Mr. James Tomison, Lightkeeper.—It is with great regret that we have to record the death of our valued contributor Mr. James Tomison, which occurred at the Royal Infirmary, Edinburgh, in September last. Mr. Tomison was a keen and excellent observer, and availed himself of the great opportunities afforded him by his calling, as his singularly interesting and well-written papers contributed to the "Annals" on the bird visitors to Sule Skerry and Skerryvore abundantly testify. He was personally known to us and won our high esteem, and we regard his death, in the prime of life, as a loss to Scottish Natural History and one which is greatly deplored.

Pipistrelle Bat in Orkney.—A male of *Pipistrellus pipistrellus* was captured at Deerness on the 21st of September last. No bat appears to have been captured in Orkney during the past fifty years, and the few that have occurred have not been identified. I sent the specimen here recorded to the Royal Scottish Museum, where my identification of it was confirmed by Mr. Eagle Clarke.—M. SPENCE, Schoolhouse, Deerness, Orkney.

Destructive Habits of the Bank Vole.—Lately I came across an instance of an unusual piece of destruction by this species. A small odd patch of ground on the outside of a large garden had been planted with potatoes late in the past season, and had been rather neglected and weed-covered. On digging the crop, at least one-half of the produce was found to be more or less eaten by these Voles (*Microtus glareolus*). Not one of the potatoes was completely eaten, as would have happened if the Water Vole or the Common Brown Rat had done the mischief. Small irregular patches on the sides of the potatoes most easily accessible were the feature of the attack. Succulent green vegetables or herbage in summer, wayside and hedgerow fruits in autumn, surface roots and soft stems in winter and spring, are usually devoured by the Bank Vole, and although I have often known it to eat a patch in an odd potato, I have not known of a general and severe attack on this crop before.—ROBERT SERVICE, Maxwelltown.

Brambling in West Sutherland.—On the 25th of October, while at Inchnadamph, I observed a number of Bramblings (*Fringilla montifringilla*). Their identification was easy from the white rump, so much in evidence when these birds are in flight. Redwings in plenty were seen all along the road from Kylesku to Ullapool *via* Knockan and Drumrunie. Fieldfares were to be

seen, but these are not nearly so numerous as they were during the autumnal migration last year.—J. T. HENDERSON.

[The Brambling has not hitherto been satisfactorily identified in the area.—EDS.]

Hawfinch in East Lothian.—On the 8th of July I received by post an immature male Hawfinch (*Coccothraustes vulgaris*), which had been found dead at Tynholm, Pencaitland, on 3rd July, and had passed through several hands before it reached me. The bird was well plumaged and had its tail about half grown. It was found by Mrs. Reid of Tynholm, lying dead near a wire enclosure where some chickens were kept, and had probably dashed against the netting. It was too far gone to make a skin of.—H. N. BONAR, Saltoun, Pencaitland.

Little Bunting and other Birds at Sule Skerry.—Mr. Allan M'Millan kindly sent me four birds for identification which he had captured at the lantern of the Sule Skerry Lighthouse on the 22nd of September last at 10 P.M., the weather at the time being hazy and the wind a S.-E. strong breeze. These proved to be a Little Bunting (*Emberiza pusilla*), Pied Flycatcher (*Muscicapa atricapilla*), Redstart (*Ruticilla phœnicurus*), and Garden Warbler (*Sylvia simplex*). The Little Bunting has occurred in small numbers on the autumn migration at Fair Isle during the past four years, and less frequently in the spring, but has not yet been detected on the mainland of Scotland, over which it can only be very thinly scattered and hence escapes notice. Sule Skerry, it may be remarked, is a rock-station situated out in the Atlantic some 33 miles W.N.W. of the Orkney Island of Hoy.—W. EAGLE CLARKE.

Red-breasted Flycatcher and other Birds at the Butt of Lewis.—Since coming here I have had a great deal of station work, and not the time I would have liked for the observation of bird life, etc. I have, however, considered the place generally rather bare and uninteresting, comparatively; there being no turnips grown in the district, and no cover for small birds. This latter half of October has, however, been exceptional, and I have been pleased to see a few Warblers and other woodland birds about for the first time. On 25th and 26th we had Blackcaps, Redstarts, and Willow Warblers. On 1st Nov. I watched for a long time, catching midges on the cliff edge, what, I am certain, is a Red-breasted Flycatcher (*Muscicapa parva*), the same species as I got last year on the Bell Rock ("Annals," 1908, p. 49). The tail was kept nearly always on the move, and often erected wren-like, and the white feathers, when it made evolutions in the air after insects, were as conspicuous as the white on a Wheatear's rump. There were no markings on the wings or body. I thought Wheatears were all

gone, as none have been seen since 29th October, but I saw one female to-day, 1st November.—ROBERT CLYNE, The Lighthouse, Butt of Lewis.

Black Redstart in the Tay Area.—On 22nd October at Balcomie, a little to the north of the East Neuk of Fife, we procured a fine specimen of a Black Redstart (*Ruticilla titys*). It was a male in beautiful plumage. We believe this to be the first record of this species in the Tay area.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER, Largo, Fife.

Coal Titmouse on the Bass Rock.—Titmice so seldom appear in the Migration Reports that the occurrence of two Coal Tits on the Bass Rock on 28th September last is perhaps worth putting on record. A leg and a wing of one of them were sent to me for identification by Mr. J. M. Campbell, the lighthouse keeper. Had the whole bird been preserved, it might have been possible to say whether it belonged to the continental or the British race.—WILLIAM EVANS, Edinburgh.

Gadwall in Fifeshire.—A young male Gadwall (*Chaulelasmus streperus*) in transition plumage was among the ducks shot at evening flight on Morton, near Tayport, on the night of the 14th November 1908. Our bag for two nights of that week (one gun) consisted of ten ducks, and included, besides the Gadwall, Mallard, Widgeon, Teal, Shoveller, Golden Eye and Scaup Duck, all killed after dusk, and when species could no longer be distinguished. We are accustomed to meet with ducks of many kinds in the course of a season, but this Gadwall is the first that has come under my notice in the eighteen years or so that I have been intimately acquainted with the moors and marshes near the mouth of the Tay, though I have heard a report that one was killed in Forfarshire at an earlier date in 1907. The bird was alone when shot, and so far no other has been seen. The "fighting" bag for that week also included a Pink-footed Goose having a curious malformation of the base of the bill, the result, I have no doubt, of some previous injury. This Goose and the Gadwall have both been sent to the Royal Scottish Museum for preservation.—WILLIAM BERRY, Tayfield, Newport, Fife.

Long-tailed Duck far Inland.—An adult female Long-tailed Duck (*Harelda glacialis*) was shot on the Spey 40 miles from the sea in October last. As this is a far inland occurrence, it may be considered worthy of a record in the "Annals."—J. R. PELHAM BURN, Roy Bridge.

Golden-eyes in the Forth Area in Summer.—On 16th May, and again on 5th June 1908, I saw a flock of eighteen Golden-eyes on Loch Leven—six of them males in adult plumage; and on 10th

June I counted nineteen on Loch Coulter among the Denny Hills. It would be interesting to know if they were seen elsewhere. A pair of Goosanders, I may add, were observed on Linlithgow Loch on 20th May.—WILLIAM EVANS, Edinburgh.

Note on the Drumming of the Snipe.—In the "A.S.N.H." 1906, p. 113, I recorded hearing a Snipe "drumming" as early as 4th February. This year I heard one in Dunfermline on 1st August, and watched it for several minutes. I think these are exceptionally early and late dates for this performance.—HUGH S. GLADSTONE, Thornhill, Dumfriesshire.

Black-headed Gulls Molesting Lapwings.—Returning late one evening I found the "Annals" for October awaiting me, and perhaps the best answer from the west regarding Mr. Evans's inquiry on above subject is to say that within twelve hours of the receipt of that number, standing in Cadder Wilderness, our great beech wood north of Glasgow, looking to the fields north of the wood, I remarked to Mr. Alex. Ross: "there are Mr. Evans's Gulls chasing the Lapwings." This is a matter of common observation here, and standing in a gap of a hedge in the Cathcart district watching this game going on in the green crops, has been a Sunday morning diversion from time to time in autumn and winter for the past twenty years.—JOHN PATERSON, Glasgow.

Note on the Moulting of the Great Northern Divers.—In my note under the above heading in the July number of the "Annals," p. 185, you have omitted to mention the moulting bird. This particular specimen was shot during the first week in February, and was in full moult, many of the primaries being missing altogether, the rest of the wings being well spotted, but the back was quite unspotted with the exception of the extreme end near the root of the tail, and here the white spots were also making their appearance. On 10th April, I only came across one fleet of them, numbering fourteen, again off Houton Head, and of these two had their heads half changed. They all dived as we sailed up to them, but only five came up from the dive, a lot of three and another of two, which also soon vanished, the former failing to come up after their third dive, and the latter being kept in view and followed for about ten minutes. On this occasion the sea was very choppy, and although we sailed right over the spot where they dived, we never saw any trace of the other nine again, including the two whose heads were half changed, as they probably only put the tips of their beaks up out of the water for a fresh supply of air. On 25th April I saw two in the flesh, sent from Orkney to my friend Mr. F. Smalley, and both these had the heads half changed, being shot on the 21st, at which date most of those seen were in this stage of plumage. The other day I saw the skin of an American-shot

Northern Diver in full summer plumage which had been shot on 22nd April, so, evidently, in America they are a week or so ahead of us in the completely changed condition.—H. W. ROBINSON, Lancaster.

Bird Notes from Tiree.—We have had eleven days' shooting, during which two guns got about 1300 Snipe, or, to be exact, 1293. Our best day was 217. A feature of the shooting was the numbers of Woodcock that were about. We seldom used to see more than one or two at this time of year. On the 10th November, I put up 9 or 10 when walking across a bit of rough ground. The place seemed to be alive with them. They looked tired and only flew a short distance—very unusual at that date. South-east strong winds continued without a break from the end of September until the second week in November. Consequently, Thrushes, Redwings, Fieldfares, Blackbirds, and other small birds were literally in thousands all along the south side of the islands; whilst Wheatears were still fairly numerous in the first week of November—very late, as they nearly all disappeared when the wind changed to the west. It shows that they are waiting for a change of wind. White-fronted Geese, which used to arrive from 15th to 17th October, did not arrive this year until 5th November; which shows that the continuous south-east winds kept them back. I dare say, it was the same cause that made the Woodcock and Snipe so abundant here. About the middle of October Mr. M'Kenzie, Scarnish, caught a Gold-crested Wren inside his window. After he had shown it to me, he let it go. A few days later, he got a young Brent Goose, which had got its wing injured against a telegraph wire. He put it in an enclosure, along with a farm Duck, and it has now become quite tame, and will take food out of the hand. Altogether there were tremendous numbers of birds on migration here until the wind changed to the west, when they nearly all disappeared. I expect there may have been some rare birds among them; but as I was busy at the time I did not have the time to look about for them. I forgot to mention that we have crowds of Swans—both Bewicks and Hoopers. They arrived as early as usual, but they came from the east and north-east, and the south-east winds did not affect them.—PETER ANDERSON, Tiree.

Labrax lupus, Cuv., in the North Sea.—A good specimen of this fish, the Basse, measuring 24 inches, and weighing 5 lbs., was obtained on the 11th October by trawler "Primrose," skipper David Kidd, fishing 30 miles east of the Bell Rock, and sent to me by Messrs. Cameron and M'Farlane, Dundee. This is the first Scotch specimen that I have seen. Parnell speaks of it as making its appearance now and then in the Firth of Forth, more particularly in the months of July and August; but the only examples that I have heard of in recent years are two got by Professor M'Intosh

in St. Andrews Bay in May 1887, and one recorded by Dr. Fulton from Kincardine-on-Forth in February 1902 ("Scottish Fishery Board's Reports, Pt. III. 1888, p. 275; 1902, p. 229).—D'ARCY W. THOMPSON, University College, Dundee.

[A specimen, weighing about 2 lbs., was captured in the Firth of Forth off Elie in November 1904, and is now in the Royal Scottish Museum. The date is an unusual one.—EDS.]

Another Occurrence of the Oar-fish in Scotland.—Referring to the article in the July number of the "Annals" on the Oar-fish, I can add another occurrence of this fish in Scottish waters, which Mr. Evans omits from his list, and which I mentioned in "The Field" of 16th March 1907, as follows: "Last week a fine specimen of the Ribbon Fish was washed ashore on the beach of Whitemill, Burness, Sanday, Orkney. It was of a beautiful silver colour, and measured 13 feet in length, 2 inches across, and about 8 inches in depth. It was quite fresh when washed ashore, but unfortunately was not preserved, and the Gulls soon made short work of it." "The Field" again mentions this specimen in its issue of 13th June 1908, when mentioning the occurrence of the Dunbar specimen.—H. W. ROBINSON, Lancaster.

Hydrachnids from Neighbourhood of Kirkliston.—During the last eighteen months, I made three or four collections of Hydrachnids from a small loch and some ponds in the neighbourhood of Kirkliston. The loch yielded the largest number of specimens, but the ponds gave very meagre results, which I attribute mainly to the lack of vegetation. In a small quarry now filled with water I was able to get some large specimens of the genus *Hydrachna*. Only fourteen species representing seven genera were found by me. *Piona* and *Limnesia* each contribute four species, while *Arrhenurus*, *Thyas*, *Hygrobates*, *Brachypoda*, and *Hydrachna* yield only one each. *Piona* and *Limnesia* are represented by *P. conglobata* (C. L. Koch), *P. discrepans* (Koen.), *P. uncatata* (Koen.), *P. carnea* (C. L. Koch), *L. undulata* (Müll.), *L. maculata* (Müll.), *L. koenikei*, Piersig, and *L. histrionica* (Herm.). None of these call for particular mention as they are fairly common species. *Hygrobates longipalpis* (Herm.) also appears to be a common species. *Brachypoda versicolor* (Müll.) cannot claim to be common. I have only found it on two occasions before, one specimen at Duddingston some years ago, and one at the Elf Loch last December. It is a small species with colour markings which tend to render it inconspicuous when creeping among the sediment which lies at the bottom of the water. *Thyas venusta* (C. L. Koch) is rather conspicuous from its bright red colour. I have also found it at Bavelaw. *Hydrachna scutata*, Piersig, can be readily seen swimming in clear water. It is one of the larger species and red in colour. The distinguishing feature is the plate situated well forward on the dorsal surface. The shape

of the plate is rather variable, which tends to make identification troublesome. One specimen of *Hydrachna* has not yet been identified, as the dorsal plate is a distinct departure from that of any species hitherto found in this country. The large genus *Arrhenurus* is poorly represented, only a few females not yet identified having been taken. I have never been able to find many specimens of *Arrhenurus*, and of those found the males are decidedly in the minority.—WM. WILLIAMSON, Edinburgh.

BOTANICAL NOTES AND NEWS.

The High Alpine Flora of Britain.—In his first article (No. 67, p. 168) Dr. Williams states that “as compared with Scotland, alpine plants descend to lower levels in Ireland.” This is an unexpected proposition, in support of which no evidence is adduced; for the eighteen species enumerated (pp. 244-250), as descending to sea-level in Ireland, are not alpine plants. They are nearly all of them plants of universal range which may be expected at sea-level almost anywhere from Land’s End to Saxa Vord. Indeed fifteen of them are recorded in the “Cybele” as descending to coast-level in the *Peninsula*, which means as much. With regard to the other three, *Galium boreale* and *Empetrum* both reach coast level in Scotland, while *Pyrola minor* no doubt has the same habit since it “descends almost to coast-level in the south of England.” Turning to our farthest north, four of these species are not known in Shetland, while two others are so very rare that no deduction can be drawn from them. The remaining twelve all occur at sea-level; not in one place, but commonly, with a frequency which varies with the prevalence of the respective species. Dr. Williams gives the descending level in only two other cases. *Vaccinium vitis-idaea* “descends to 30 m. in Armagh,” while so far it has not been noted below 120 m. in Shetland. This is the only case which really seems to favour Ireland in the comparison with Shetland, but here again we are dealing with a rare plant known only from a few scattered localities in the northern group of islands. On the other hand, the truly alpine *Saussurea alpina* “descends to 305 m. in Donegal”; but it descends to 244 m. in Shetland,¹ though I have not myself seen it so low down.

Besides the plants referred to above, three others, for which Dr. Williams gives no descending limit, are all found at sea-level in Shetland.—W. H. BEEBY.

Nasturtium palustre, DC., in Orkney.—In September 1908 Mr. M. Spence sent me specimens of the above species from N.

¹ Tate in “Journ. Bot.,” 1866, p. 6.

Ronaldshay, the northernmost island of the Orkneys. This is about $59^{\circ} 20'$ N. lat., and a far northern extension of its range in Scotland. Dr. Trail's Kincardine station is north of the Forfarshire ones, but there seems no record north of this except for S. Aberdeen (92).

In Sweden its range is almost continuous from Skåne to Lapland; in N. and S. Norway and in Finland it extends to all the provinces except the three most northern, and occurs up to 68° N. lat. It is absent from the Faroes, but occurs in Iceland. The Iceland plant was called var. *islandicum* by the Icelandic author Hjaltalin in 1830; and was figured in "Fl. Danica," t. 409 (1768), as *Sisymbrium islandicum*, Oed. That it will bear a very cold climate is shown by Laestadius,¹ who writes:—"It may be observed that it is only during warm summers that *Nymphæa*, *Potamogeton*, *Myriophyllum*, and other water plants reach their full development." "*N. palustre* occurs near Karesuando and Enontekis." In Canada it occurs north to York Factory, about 57° N. lat.—ARTHUR BENNETT.

Crithmum maritimum, L., in the Outer Hebrides.—Mr. Gibson of Stornoway, Lewis, has lately (11th October 1908) sent me a fresh specimen of the above plant, gathered on the Mangursta cliffs, a little north of the island of Eilean Molach, on the west coast of the Lewis, in lat. $58^{\circ} 10'$. This a really interesting extension of habitat, as in Scotland it is only recorded for Ayr, Wigton! and Kirkcudbright. In August 1906 the late Mr. A. Somerville sent me specimens gathered on "Machrins coast rocks at sea-level" in the Isle of Colonsay, V.C. 102, this being about $56^{\circ} 5'$ N. lat.

In Europe it is not recorded north of lat. 51° , except in our isles. Its most northern station seems to be on the coast of Normandy in France. The distribution given by Nyman² for Europe will show how little it can be claimed as a northern species, *i.e.* Britain, Spain, Portugal, France, Italy, Istria, Croatia, Dalmatia, Herzegovina, Macedonia, Ionian Islands, Taurus. It also occurs in Algiers, the Canaries, the Azores, and Madeira.

It belongs to an order that, with few exceptions, does not range far northwards. No doubt the open Atlantic, with the Gulf Stream impinging on the coast or very near it (unless it has been diverted as lately suggested), allows of species occurring that would otherwise be unable to survive. It was reported for the coast of Fife; but if it existed there it seems now extinct, and Greville in his "Flora Edinensis" (1824), 62, says: "Said to grow in the islands in the Firth of Forth, but not now to be found."

Mr. Gibson also sends a specimen of *Mercurialis perennis*, and mentions *Veronica Chamædrys* as "common in the Castle grounds,

¹ "Bid. t. känn.," i. Torneå Lappmark, 1860.

² "Consp. Fl. Europ.," ii. (1879), p. 292.

and this neighbourhood"; these are both additional records for the Outer Hebrides.

Crithmum maritimum has sometimes been said not "to grow on the sand"; but this is certainly an error. I have seen it on pebbly beaches, on sandy shores, and on the chalk cliffs of the south of England.—ARTHUR BENNETT.

***Limosella aquatica*, L., in Dumbarton.**—Mr. L. Watt of Clydebank has sent specimens of the above species from a dam at Duntocher in that county, some nine miles from Glasgow. It is only on record for Ayr in the west, and for Haddington, Forfar, and Kincardine in the east of Scotland. Mr Watt writes: "One side of the dam being dry was covered with *Limosella*." No doubt it is one of those species that can easily be passed over, especially if the water-level is high. Its range is continuous in Sweden from Skåne to Norland; and it occurs in Swedish, Finnish, and Russian Lapland (though rare) north to 69° 50' N. lat. South of lat. 67° it is generally dispersed in Finland.—ARTHUR BENNETT.

***Carex atrofusca*, Schler (*ustulata*, Wahl), in Perthshire.**—In the "Trans. Nat. Hist. Soc. of Glasgow," vii. (1907), p. 232, Mr. P. Ewing, in a paper entitled 'An Œcological Problem,' remarks:—"Nyman in his *Conspectus Europæa* mentions this plant from Lawers, but I am inclined to think that this is an error caused by the common expression, 'Scotch mountains,' of the older botanists. Evidently he was not aware that Dr. Paul found the species, on July 22, 1892, 'on one of the slopes of the hill that descends to the loch, Lochan à Chait.'" According to Dr. F. A. Lees in "The Naturalist," September 1884, p. 70, in a review of the 3rd edition of Hooker's "Students' Flora," "Specimens undoubtedly gathered on Ben Lawers within about forty-two years, by the late Surgeon Newnham, are in more than one herbarium; and the writer found one amongst a number of other carices sent him to be named by F. C. King of Preston, gathered on the same hill within five years, unrecognised at the time, the collector being a comparative tyro." These dates make for years about 1842 and 1879 respectively.

If so, Don's report of the species was confirmed many years before any notice or publication of the fact was made known, Mr. Brebner's discovery of the plant on Ben Heagsarnich dating from July 1885.

It remains a remarkable thing that from 1810, the date on Don's specimens, it should have escaped notice for so many years, on a mountain so often ascended by botanists. Mr Pickard of Leeds notes that the late Mr F. C. Crawford found it on Craig-Cailleach in Perthshire. Did that botanist record that find anywhere?—A. BENNETT, Croydon.

***Physcomitrella patens*, B. and S., in Scotland.**—On 24th October last I found this interesting little moss at Torduff Reservoir

near Colinton, Midlothian; it was subsequently detected also at Clubbiedean Reservoir in the same neighbourhood. The water has been very low in these ponds all summer, mosses and liverworts having thus been given time to appear on the exposed mud, which is of considerable area. The *Physcomitrella* occurred abundantly along with antheridia-bearing plants of *Funaria hygrometrica*, Sibth., and *Riccia crystallina*, Linn., in both localities. In the "Census Catalogue of British Mosses," issued in 1907 by the Moss Exchange Club, there is no mention of *Physcomitrella patens*, B. and S., in any Scottish county. The identification was verified by Mr. H. N. Dixon, F.L.S.—W. EDGAR EVANS, Edinburgh.

Rosa spinosissima, Linn., × *mollis*, Sm., in Banffshire. — In July last, whilst visiting Boyne Castle, near Portsoy,[†] I met in with a fine clump of what I have no doubt is this hybrid. It was growing on the lofty, tree-shaded bank of a gorge which runs down from the castle to the sea. There were numerous bushes of *R. spinosissima*, Linn., growing around it, and *mollis* and other species were also not far off.

Its prickles are precisely those of *R. spinosissima*, Linn., even affecting the declining habit often found in those of that species. In the form of its leaflets, however, it closely approaches the shape of those of *R. mollis*, Sm. They are softly hairy in both surfaces, the hairs rather long and appressed. In colour they are of a very glaucous hue, with a bluish tinge, darker above, paler below. Sub-foliar glands are present, but in very small quantity, chiefly on the midrib. The serration is composite-glandular. The upper stipules are much dilated, though varying in this respect; some are glandless, others densely glandular on the back. The peduncles, fruits, and sepals are more or less densely glandular. The sepals are long and slender, broadened at the point, and perfectly simple. Some leaves with nine leaflets occur on the flowering branches.

The shape, colour, and clothing of the leaflets, the dilated stipules, and the long, slender, and simple sepals seem to me to leave no doubt as to the parentage of this form.—WILLIAM BARCLAY.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—October-December 1908.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

NOTES ON THE NATURAL HISTORY, GEOLOGY, AND ANTIQUITIES OF DUROR, ARGYLLSHIRE. Rev. G. A. Frank Knight,

M.A., F.R.S.E. *Trans. Perthshire Soc. Nat. Science*, vol. iv. part v. (1908), pp. 213-228.—A list of Marine Molluscs, comprising 51 species, is given on p. 214.

MOLE VARIATION. Robert Service. *Trans. Edin. Field Nat. and Micro. Soc.*, vol. vi. part i. (1908), pp. 64-65.

GOLDCRESTS FROM EAST COAST LIGHTHOUSES. William Evans. *British Birds*, December 1908, pp. 232-233.—Specimens captured at the lantern of the Isle of May and Barnsness Lighthouses in October were of the British form.

HOOPOE IN ROSS-SHIRE. Col. W. H. E. Murray. *The Field*, September 19, 1908, p. 547.—Specimen caught at Geanie's on 9th September.

SCOPS OWL OFF ABERDEENSHIRE. E. R. Paton. *British Birds*, November 1908, p. 204.—Refers to a specimen captured on a trawler, about 25 miles off the coast of Aberdeenshire in October 1900.

A MARKED PINTAIL. A. R. *The Field*, December 5, 1908, p. 1021.—Specimen shot on the shores of the Dornoch Firth at Edderton, Ross-shire, with a metal ring on its right leg, marked "H. Chr. Mortensen, Vigborg, Denmark, 366."

ON THE NESTING OF THE SCAUP DUCK IN SCOTLAND. P. H. Bahr, M.A., M.B., etc. *British Birds*, December 1908, pp. 209-217, 4 figs.

WHITE SNIPE IN ARGYLLSHIRE. H. M. B. *The Field*, December 5, 1908, p. 1021.—A pure white specimen, with black eyes, shot at Coll on 21st November.

TERN IN WIGTOWNSHIRE IN OCTOBER. J. Lawrence Sowerby. *The Field*, October 24, 1908, p. 721.—A solitary tern, believed to be the Sandwich Tern, observed off Barsalloch Point on 14th October.

FULMAR PETREL IN THE FIRTH OF FORTH. W. F. T. Malloch. *Zoologist*, October 1908, p. 396.—Specimen picked up dead at Canty Bay on 17th July.

SPHINX CONVULVULI AND ACHERONTIA ATROPOS IN SELKIRK. B. Weddell. *Entomologist*, November 1908, p. 272.

ACHERONTIA ATROPOS IN INVERNESS-SHIRE. Henry H. Brown. *Entomologist*, November 1908, p. 272.—Specimen picked up dead at Milton, near Drumnadrochit, on 28th September.

NOCTUA DITRAPEZIUM, A SCOTCH SPECIES. R. Meldola. *Entomologist*, November 1908, p. 273.—Specimen taken at sugar at Fortrose in August 1903.

NOTE ON THE SCOTTISH MOUNTAIN FORM OF NOTIOPHILUS AQUATICUS, L. G. C. Champion. *Ent. Mo. Mag.*, December

1908, p. 271.—This form is compared with *N. pusillus*, Waterh., and with the typical form of *N. aquaticus*, L.

PYROPTERUS AFFINIS,^o PAYK., AT NETHY BRIDGE. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 273.

HABITAT OF ANASPIS SEPTENTRIONALIS, CHAMP. Horace Donisthorpe. *Ent. Mo. Mag.*, November 1908, p. 255.—Note on a specimen taken at Nethy Bridge, in September.

CRYPTOPHAGUS SUBDEPRESSUS, GYLL., AND MELANOPHTHALMA SIMILATA, GYLL., AT NETHY BRIDGE. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 272.—Both species taken on spruce fir.

PHLEOPHILUS EDWARDSI, STEPH., AT NETHY BRIDGE. T. Hudson Beare. *Ent. Mo. Mag.*, December 1908, p. 273.—A single specimen obtained on 13th September.

ECCOPTOMERA MICRIPS, MG., AND OTHER DIPTERA IN MOLES' NESTS IN THE EAST OF SCOTLAND. William Evans. *Ent. Mo. Mag.*, December 1908, p. 277.—Besides the species mentioned in the title *Lonchoptera lutea*, Pz., var. *palustris*, and undetermined species of *Limosina* and *Sciara* are recorded from various localities.

ON THE BRITISH SPECIES OF PHORA (PART II.—concluded). John H. Wood, M.B. *Ent. Mo. Mag.*, October 1908, pp. 217-218.—*P. fuscinervis* and *campestris*, 8 pp. nn., recorded from Bonhill.

NOTES FROM THE GATTY MARINE LABORATORY, ST. ANDREWS, Prof. M^oIntosh, M.D., LL.D., F.R.S., etc. *Ann. and Mag. Nat. Hist.*, December 1908, pp. 524-544, pls. xii. and xii.a—These notes include an account of an adult female *Mesoplodon bidens*, Sowerby, stranded at St. Andrews in May, and record the occurrence of *Orthogoriscus mola*, Bl., off Crail on 9th October.

BOTANY.

NOTE ON "THE LONDON CATALOGUE," 10th ed., by Rev. E. S. Marshall, F.L.S. (*Journ. Bot.*, 1908, pp. 313-319), and NOTES ON THE FOREGOING, by James Britton, F.L.S. (*Journ. Bot.*, pp. 320-322).—Includes a good many references to Scotch plants.

THE GENUS ROSA IN "LONDON CATALOGUE," 10th ed., by W. Barclay (*Journ. Bot.*, 1908, pp. 356-358).

INVERNESS-SHIRE CRYPTOGRAMS, by Albert Wheldon, F.L.S., and J. A. Wheldon, F.L.S. (*Journ. Bot.*, 1908, pp. 347-356).—Enumeration of species observed in July 1908 in Rothiemurchus, belonging to mosses, liverworts, and lichens, a good many being new records for the district.

LEATHESIA CRISPUS, by A. D. Cotton, F.L.S. (*Journ. Bot.*, 1908, pp. 329-331).—Epiphytic on *Chondrus crispus*, first described by Harvey from Cumbræ.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS, by James Britton, F.L.S., and G. S. Coulger, F.L.S. (*Journ. Bot.* 1908, Nov. Supplement, pp. 1-15). Includes a number of natives of Scotland.

BOOK NOTICES.

ANIMAL LIFE. By F. W. Gamble, D.Sc., F.R.S. Pp. 305, with 63 illustrations. London: Smith, Elder, and Co. Price 6s. nett.

Of the legions of books issued in recent years which have been devoted to the elementary study of animal life this is one of the most readable and most valuable. Not that it contains more matter of fact than the average nature study book—indeed the average nature study book is generally so over-crowded with matters of fact that the legitimate fancies of the biologist, the theories which endeavour to reduce his hotch-potch of facts to system, are crushed out—but because here structural details and the like are placed in their proper settings, and are treated, not as isolated items of information, but as illustrations of some established generality. Dr. Gamble aims at “dealing with the adaptations and factors of animal life in a broad and connected manner,” and he has adopted a method of treatment which admirably carries out his object. In turn the great life-activities and the responses which they have called forth are taken up and discussed under such headings as—the organisation of animal life, movement, the quest for food, the breath of life, the senses of animals, the colours of animals, and the welfare of the race; while the scheme is completed by a long chapter on the life-histories of insects. Throughout, as must be within so limited a compass, the treatment is suggestive rather than complete, but the material has been carefully chosen, and so skilfully have the themes been handled that the discussion never fails to be both interesting and stimulating.

Of adverse criticism we have little to offer. On p. 33 it is alleged (as, indeed, is usual) that in the Brittle-Stars the tentacles have no suckers at their tips, and that the creature's movement is an ungainly shuffle caused only by fin-like motions of the arms. But surely such an explanation does not allow for the fact that Brittle-Stars can cling to and climb the glass walls of aquaria? The reference on p. 113 to fig. 19 F should obviously be to fig. 26 F.

The get-up of the book is pleasing, the type clear, and the

illustrations, many of which are from photographs of nature studies in the Manchester Museum, are on the whole excellent. According to the preface the work is "written in the first instance for those who wish to learn or teach such a survey of the animal pageant as can ally itself with observation and experiment; and in the second place for those who wish to organise their knowledge of animal life," and to each of these classes no better guide to animal study could be recommended.

J. R.

THE GAME ANIMALS OF AFRICA. By R. Lydekker. London: Rowland Ward, Limited, 1908. Price 25s. net.

The volume under notice affords much interesting matter and useful information relating to the numerous and varied forms of the larger mammals to be found in the vast continent of Africa—the most fascinating of all the hunting grounds of the world. All these species, and their various races, are adequately described, and their geographical distribution, haunts, habits, etc., fully treated of. The book is abundantly illustrated by 15 plates and 93 text figures, which are a valuable adjunct to a work of this kind, and which from their great excellence will be duly appreciated. It is the latest and at the same time best and most concise treatise on the game mammals of Africa that has ever appeared.

THE INDIAN DUCKS AND THEIR ALLIES. By E. C. Stuart Baker, F.Z.S., M.B.O.U. With 30 coloured plates. Published by the Bombay Natural History Society. London: R. H. Porter, 1908. Price 42s. net.

The Bombay Natural History Society is well known for the yeoman service it has rendered to the cause of Indian zoology; and this, its latest product, is a valuable contribution to our knowledge of the Indian members of an interesting order of birds. The information afforded concerning each of the 45 species treated of is of a comprehensive and interesting nature, both from the standpoint of the naturalist and the sportsman; nothing appears to have escaped the vigilance of the author, who has gleaned facts from widely scattered sources; while the 30 coloured plates are first-rate specimens of modern bird-pictures. The work, too, has been exceedingly well planned; the descriptions of the various stages of plumage are excellent; and he would, indeed, be a captious critic who could find fault with the get-up of the volume, either externally or internally—it is beautifully bound in half-morocco and is handsomely printed. A considerable number of the species included are more or less familiar British birds, and it is both interesting and instructive to become acquainted with them in their Indian haunts, and to learn something about their habits in their eastern winter retreats. As last words on this handsome volume, we desire to express the hope that the Society will regard this book as the forerunner of a series devoted

to the avifauna of our great Indian Empire. The Society includes within the ranks of its membership the necessary talent for producing the standard work on Indian birds : we hope that it will avail itself of its resources.

ENGLISH BIRD LIFE. By H. Knight Horsfield, M.B.O.U. London : Everett and Co., 1908. Price 7s. 6d. net.

Mr. Knight Horsfield has produced a very readable book : one that is written in a bright and pleasant style which will appeal to bird-lovers both old and young. The book is divided into nineteen chapters. The first of these treats of the diurnal birds of prey ; and here the author says a good word on behalf of the smaller hawks, pointing out that their food consists chiefly of voles, mice, and insects. An excellent account is given of the various Warblers in the chapter devoted to "The Birds of the Woodlands," slight mention being made of our more uncommon visitors, such as the Icterine and Yellow-browed Warblers. Under the heading of Tree-Climbing Birds, the habits of the Woodpeckers, Tits, Creeper, Wryneck, and Nuthatch are described, and the reader will see that the author is both a keen, patient, and happy observer of bird-life. The Finches, Crows, and Thrushes are discussed in separate chapters, while 56 pages are given to "Birds of the Field" and "Birds of the Heath." The two sections referring to "Birds of the Moorland" and "Birds of the River" strike us as particularly interesting, as do also the chapters relating to the Pheasant and Woodcock. The author has a pleasant way of imparting his knowledge, and his descriptions and observations are given in a bright and entertaining manner. A particularly good description is given (p. 427) of a winter's evening on the sand-dunes with the gloom and mist hanging over the adjoining mud-flats. The illustrations are all from photographs from life, and they are remarkable for their excellence and clearness ; mostly by Mr. T. A. Metcalf. On looking over a hundred of these photographs one realises that the author in no way exaggerates when he states in the preface that the illustrations represent the work of years spent in observation. The addition of an index would have been a useful adjunct to an excellent little volume. G. G.-M.

HOW TO ATTRACT AND PROTECT WILD BIRDS. By Martin Hiesemann, translated by E. S. Burchheim. London : Witherby & Co., 1908. Price 1s. 6d. net.

The lovers of our native birds, and they are fortunately a numerous body, cannot fail to welcome this little volume on the protection of their favourites. The subject is treated from a scientific point of view, and, as the author points out (on p. 21), "Baron von Berlepsch has made it possible for us to carry out the protection of birds on a basis which is rational and entirely in accordance with Nature." The experimental station on the estate of Seebach (situated in the

district of Langensalz in Thuringia) comprises about 500 acres, of which 19 acres are park, 60 acres are thicket, and 400 acres are wood. Over 50 different species of birds are enumerated as nesting in the "Home Park" and "Shelter Woods," whilst the lake is inhabited by various species of water-birds. The Baron's system of protection is based on three fundamental ideas: first, *creating opportunities for breeding*; second, *winter-feeding*; and third, *fighting the enemies of birds*. He is of the opinion that success can only be attained if these measures are carried out in close connection with each other. The first chapter deals with the subject of the provision of nesting-places, and distinguishes between those birds which build in regular holes and those which prefer irregular cavities and niches. With this end in view he has had nesting-boxes built to his own design (which is a close imitation of Nature), and these are described in detail, so that the reader may have them constructed in his own workshop. The position in which these boxes should be placed is of much importance, and careful instructions are afforded on this point. It is interesting to notice that out of the 9300 boxes erected by the Government in the State and Communal woods of the Grand Duchy of Hesse, 70 to 80 per cent were used in the first year, whilst in 1907 every box was inhabited. These facts speak for themselves. The second chapter deals with the extensive plantations which have been laid out at Seebach, and a list is given of the various shrubs and bushes, and the question of cutting and pruning is carefully gone into, and should be read by all who are anxious to encourage the breeding of birds in their grounds. The subject of the feeding of birds in winter is thoroughly gone into, and the idea of the food tree, the food house, and the food bell will probably be new to most readers. We notice that mention is not made of supplying water, and this is an important fact, especially in winter. Not the least interesting portion of the book is that which treats of the economic value of birds. An instance is cited of a certain wood adjoining the Seebach estate having been stripped bare one spring by the larvæ of a little moth (*Tortrix viridana*), whilst Baron Von Bulepsch's woods (in which 2000 nesting-boxes had been erected) were left quite untouched. As regards the question of the suppression of the birds' enemies, the author gives some interesting facts. Baron Von Berlepsch strenuously teaches that it is unwise to allow certain birds and animals to develop at the expense of others, and that man must step in to regulate matters. G. G.-M.

CONDITIONS OF LIFE IN THE SEA. By James Johnstone. pp. xiv + 332. Cambridge University Press, 1908. Price 9s. net.

Every one interested in the progress of our knowledge of the sea and its inhabitants, especially he who is curious as to the economic

resources of the deep and the influences which affect them, will be grateful to Mr. Johnstone for bringing together in convenient form the results of much of the work recently accomplished in marine science. The department of knowledge which endeavours to deal with the productions of the sea from a quantitative point of view is of comparatively recent origin, and even yet, as Mr. Johnstone's pages undisguisedly show, has only reached the hesitating stage of infancy—though, to be sure, the healthy infant and of great promise. This slowness of advance is in great part due to the exceedingly complicated nature of the problems which the quantitative biologists have set themselves, for obviously the seasonal fluctuations of organisms and the distribution of marine creatures in general are dependent upon physical causes, and on this account extended hydrographical and oceanographical investigations have been rendered necessary. With all those branches of study, with the methods and results of quantitative marine biological research, and with hydrography and oceanography in so far as they bear thereon, Mr. Johnstone deals clearly and interestingly. Some of the results are almost incredible. For instance, we are told that 1 cubic metre of water from the Mediterranean Sea off Syracuse contains in all 2,425,665 drifting organisms, and that the number of haddocks in the North Sea in the spring of 1905 was calculated at 180,239,000, and we are enlightened as to the methods by which those approximate results are obtained.

This, the main portion of the book, is preceded by a useful introductory part dealing with the apparatus and methods employed in oceanographical research, with life in the sea, its distribution, fluctuations, and general significance, and with the economic population of the sea and the modes by which it is exploited. Part III., on the general conditions of marine life, contains many results of great interest. Thus Pütter's researches seem to indicate that many marine animals—Sponges, Holothurians, Copepods—utilise as food, not so much solid organic particles, as the inorganic carbon and nitrogen dissolved in the sea water.

Mr. Johnstone has brought together with great care and much labour a guide to recent marine research indispensable to the general biologist who, unable to devote special attention to the conditions of life in the sea, yet wishes to keep abreast of advancing knowledge. To say that the book belongs to the Cambridge Biological Series is to vouch for the high standard of typography, paper, and binding.

We mention the following slips for the sake of future editions:—on p. 46, "*minimum* contraction" for "maximum contraction"; p. 48, "ocean currents are deflected to the *right*" is ambiguous, "west" would be clearer; p. 58, "*mussels* beds" for "mussel beds"; p. 312, "*Luidia*, a bottom-loving *sea urchin*"!! J. R.

THE CHANGELING, A NATURE STORY FOR BOYS AND GIRLS.
By Sir Digby Pigott, C.B., M.B.O.U. London: Witherby & Co.,
1908. Price 2s. 6d. net.

Sir Digby Pigott has written a very charming little nature book in *The Changeling*. The hero of the story, Tommy, is able, through the assistance of his guide Johnny Fairy, to lead the actual life of his animal friends. His first excursion is taken as a Bee, when escorted by his cicerone he visits a large hive and is shown all the wonders of bee-lore. The workings of these wonderful insects are clearly and accurately described. Tommy's flight with the Rooks is one of the most interesting chapters, and the youthful reader will learn from it of the practical use this bird is to the farmer; whilst the drawing of the mole's nest will give a clear idea of the underground fortress of "the little gentleman in black velvet." A description is given of the cliff-climbers and how they gather the sea-birds' eggs; whilst the wanderings of the Storm-petrels tell of the wild life of these ocean-tramps. The hero's trips, however, are not confined to Great Britain, and an account is given of the flight of the Wild Geese to the far North; whilst another chapter tells of Birds of Paradise, and incidentally something is learned of the inhabitants of New Guinea. The charm of the book seems to lie in the blending of poetical feeling with scientific accuracy. The young reader will gather much knowledge of birds and insects, whilst at the same time he will realise that "all the world is fairyland." The illustrations are above the average: there are 39 drawings in black and white, all of which are very true to life, whilst the four coloured plates are also pleasing. The book will form an excellent and instructive Christmas present for young people. G. G.-M.



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WHALING IN SCOTLAND FOR 1908.

BY R. C. HALDANE, F.S.A. (Scot.).

I RETURNED home from Uganda on 4th August and, consequently, saw but little of whaling this season. The catch was :—

STATIONS.	<i>B. musculus.</i>	<i>B. sibbaldii.</i>	<i>B. borealis.</i>	Sperm.	<i>B. biscaiyensis.</i>	<i>Megaptera.</i>
Norronea Co. .	...	...	...	...	...	...
Shetland Co. .	60	...	22	...	...	...
Alexandra Co. .	72	...	20	...	...	...
Olua Co. .	165	...	136	...	...	...
Bunevenader Co.	51	17	34	1	20	1
	348	17	212	1	20	1

B. borealis were more abundant, *B. musculus* scarcer than last year ; the reason given for this is that during the time of the 40-mile limit there were plenty of *B. musculus* within the limit, doubtless feeding on the herring which were abundant on the west coast of Shetland, while beyond the 40 miles *B. borealis* were plentiful and *B. musculus* not so numerous. It will also be noticed that Sperms and Megaptera were rare. In fact, the latter seem to have left the coast of Shetland, though they were never numerous.

BALÆNOPTERA MUSCULUS: Common Rorqual.

The following gives the particulars of these whales:—

STATIONS.	Number of Bulls killed.	Average Length.	Number of Cows killed.	Average Length.	Proportion of Bulls per cent.	Proportion of Cows per cent.
		ft. ins.		ft. ins.		
Shetland Co. .	31	59 9	29	59 0	51.7	48.3
Alexandra Co. .	37	60 6	35	61 7	51.4	48.6
Olna Co. .	78	60 4	87	61 2	47.2	52.8
Bunevenader Co.	22	60 3	29	64 5	43.1	56.9
	168	60 3	180	61 6	48.3	51.7

To take the average of the last four years, the sizes and proportion of bulls to cows works out—

	Average Length of Bulls.	Average Length of Cows.	Proportion of Bulls per cent.	Proportion of Cows per cent.
1905-1908	59.8	61.9	53.2	48.0

Of course, if the undersized animals were deducted, the average size would be greater, as I pointed out in "The Annals of Scottish Natural History" for July 1906, which showed the average length of bulls to be 62.2 feet and cows 64.0 feet.

The lengths of the largest bulls got this year were—

	Feet.
Shetland Station . . .	68, 67
Alexandra „ . . .	72, 72, 72, 65
Olna „ . . .	72, 70, 67
Bunevenader „ . . .	68, 68

The largest cows measured—

	Feet.
Shetland Station . . .	73, 71, 70
Alexandra „ . . .	74, 72, 71
Olna „ . . .	75, 73, 72, 72
Bunevenader „ . . .	76, 73, 71, 70

BALÆNOPTERA SIBBALDII: Sibbald's Rorqual. Blue Whale.

Of the 17 whales of this species killed at Bunevenader station 9 were bulls averaging 65.3 feet in length, 8 were cows averaging 67.6 feet. The largest was a cow of 80 feet, while the largest bull was 77 feet. It seems as if these whales do not attain the length they

do in other seas. The girth of the 80-foot cow is given at 46 feet, while the 77-foot bull is given at 34 feet. To take the average lengths of the Blue Whales killed in Scottish waters in the last four years, we find 68 bulls averaged 70.4 feet long, and the proportion of bulls to cows was 61.2.

Forty-three cows averaged 72.9 feet long, and the proportion of cows to bulls was 38.7.

So the bull Blue Whales were about 11 feet longer than the Finner bulls during four years' observation, and the cow Blue Whales were 11 feet longer than the Finner cows.

Captain Castberg writes me about whaling in the Antarctic. "The Blue Whales down there are bigger than I ever saw them, up to 120 feet long and of an enormous girth. It seems to be just the same sort of whales South as we have North." He says whales are numerous down there, excepting Sperms and *B. borealis*.

BALENOPTERA BOREALIS : Rudolph's Rorqual. Seihval.

These whales were plentiful this last season; to my mind the most graceful of all whales, as its proportions are so perfect and wanting the clumsy strength of the two larger Balænoptera, Sperms, and Megaptera. It is also far the best whale to eat, the flesh tasting of something between pork and veal, and quite tender.

I give a table of these whales killed in 1908 :—

STATIONS.	Number of Bulls killed.	Average Length.	Number of Cows killed.	Average Length.	Proportion of Bulls to Cows.	Proportion of Cows to Bulls.
		ft. ins.		ft. ins.		
Shetland Co. . .	16	43 5	6	45 3	...	...
Alexandra Co. . .	11	44 7	9	45 0	...	...
Olna Co. . .	75	44 3	61	46 2	...	...
Buneveader Co. .	16	43 0	18	45 4	...	...
	118	43 9	94	45 5	55.7	44.3

To take the results of the last two seasons—

291 bulls averaged . . . 42.8 feet.
251 cows averaged . . . 43.8 "

The Seihval are certainly the second most common whales in Shetland waters, always excepting *B. rostrata* and the smaller whales, of which I know nothing. But I have noticed that they are restless—one week there will be plenty, the next week none. I have before pointed out how a storm took them away both from Buneveader and Shetland: they certainly seem to be of a shy nature.

PHYSETER MACROCEPHALUS: Sperm Whale.

Bunevenader station got one sperm whale this year, a bull of 60 feet. Since 1903, 19 sperm whales have been killed in the seas around Scotland. These include the 57-foot cow killed by the Bunevenader Company, and to which I called attention in July 1906. The average length of these 19 whales is 58.2 feet. They are at most rare visitants to Scottish waters, though a dead cow was found off Ronas Voe in 1902. The capture of the cow is, I believe, unique in British Natural History.

BALÆNA BISCAYENSIS: Atlantic Right Whale—the Nordcaper of the Norwegians.

Bunevenader got 20 of these rare whales—12 bulls averaging 43.8 feet, and 8 cows averaging 44 feet.

Taking the total whales killed in Scottish waters, I find that 28 were bulls averaging 45.1 feet long, and 22 were cows averaging 46.1 feet. The proportion of bulls to cows being 56.0, and the proportion of cows to bulls being 44.0.

The whalebone of these whales is said to be worth £700 a whale. They are got in or about the Antarctic seas, a correspondent telling me his steamers got 17 in 1907-8. This is rather different to what I wrote last year, and different to the experiences of the Dundee whalers in 1892-3. But "Antarctic" is a wide word, and in a part of the ocean so little known these whales may exist in different localities.

MEGAPTERA LONGIMANA: Humpback, Knul.

Bunevenader station got a bull of 51 feet long and 28 in girth. They are rare whales in Scottish seas. I only can give a record of the following:—

12 bulls averaging	. . .	44.6 feet.
5 cows averaging	. . .	42.4 „

From the coast of Brazil to the Antarctic they abound. One company last year got 305. These whales yield a great deal of oil for their size, and are consequently more sought after than the Finners.

I am indebted to Mr. Lund for the catch of whales at the Arranmore station in the North of Ireland:—

5 <i>B. biscayensis</i> .	31 <i>B. borealis</i> .
19 <i>B. sibbaldii</i> .	1 <i>Megaptera</i> .
21 <i>B. musculus</i> .	

This is interesting, as it helps to trace the course of the Atlantic Right Whale to Iceland. It also shows that *B. sibbaldii* follow the

same track between Scotland and Ireland. It is to be regretted that we do not know more of the whales on the West of Ireland.

By the kindness of Mr. T. Salvesen, Leith, I give catch of Mr. M. C. Bull, Iceland :—

10 *B. sibbaldii*.

70 *B. musculus*.

11 *Megaptera longimana*.

2 *B. borealis*.

And at the Dansk Hvalfangst and Fiskin Co. :—

4 *B. sibbaldii*.

45 *B. musculus*.

51 *B. borealis*.

4 *Hyperoodon rostratum*,
or Bottle-nose.

These catches throw some light on the migration of whales.

I do not think it necessary to give in future any particulars about the sizes of whales caught at the different stations unless any of peculiar rarity should occur. I have already given the average size of 912 *B. musculus* bulls and of 762 cows, and sufficient particulars about size and proportion of bulls to cows of *B. sibbaldii* and *B. borealis* to give the needed information, also what information I could get about Sperms, Atlantic Right Whales, and Humpbacks, all more or less rare whales in Scottish waters, which I trust may prove more or less useful to naturalists.

To show the risks of whaling, the gunner of the s.s. *Noronha* fired at a whale, missed it, and the harpoon ricocheted, the attached cable snapped, the slack coming back shattered the poor man from head to ankle. He died soon after.

THE BIRDS OF FAIR ISLE.—IV. REPORT ON OBSERVATIONS MADE DURING THE YEAR 1908.

By WM. EAGLE CLARKE, F.R.S.E., F.L.S.

WITH the year 1908, the Fair Isle ornithological investigations entered upon a new era. Being convinced, by the experiences gained during my short visits, that the island was a most important station for observing the movements of migratory birds, I determined, if the necessary help were forthcoming, to obtain for 1908 a day to day record of the feathered visitors; in fact, to establish a bird-watching station, and to appoint an observer whose duty it would be to devote the whole of his time to the investigations.

Thanks to the generosity of a few friends, which I desire to gratefully acknowledge, I was enabled to carry my project to a practical conclusion, and George Stout (an excellent and capable youth, who had previously helped me, and had been well trained in my methods) was appointed observer.

Much assistance has also been rendered by my many friends among the islanders, and special acknowledgments are due to Messrs. J. W. Anderson, George Stout, *ter.*, Stewart Stout, and to the Lightkeepers.

I spent six weeks on the island in the autumn, during which I devoted the whole of my time to the investigations. In connection with my visit, I have to express my great indebtedness to Her Grace the Duchess of Bedford, who most kindly placed her beautiful yacht, the *Sapphire*, R.Y.S., at my service to convey me to the island—an act of kindness which relieved me of some anxiety, for the island is by no means easy to reach, or to get away from.

The results obtained for the year are very remarkable, and more than confirm my high opinions of the importance of the island as an ornithological observatory; indeed, the value of the record has greatly exceeded my most sanguine expectations. The records are very voluminous, but it is not my intention to deal with them at present, more especially as I hope to be able to continue the daily observations for a year or two. It is also my intention to visit Fair Isle during both the spring and autumn of 1909, and to personally assist the observer.

During the year the visits of no less than 140 species of migratory birds were recorded. Of these 106 species came under notice during the passage northwards in spring, and 122 species when moving southwards in the autumn. The identical species known to have appeared on both the spring and autumn passages were 89. The new birds added to the ornis of the island were 25 in number, making its total known avifauna at the end of the year 185 species. Several of these additions are new to the fauna of Scotland.

It is only proposed here to treat of the species added to the fauna during 1908, for I do not consider it necessary to allude to the occurrences of a number of interesting

birds, which have been recorded for past years ; they, and the great mass of information relating to the times of appearance of the regular migrants, are reserved for publication in a future contribution.

A pleasant duty remains to be discharged. I have to express to Mrs. Bruce, of Sumburgh, and to the Commissioners of Northern Lighthouses, my great appreciation of the privileges they most graciously granted me, and to Mr. Dick Peddie for his helpfulness and advice. My acknowledgments are also due to Mr. and Miss Wallace for their kindness and attention during my residence in the lighthouse ; and, finally, my good friends among Fair Islanders have earned my sincere thanks for allowing me to tramp their crofts, —without such permission very much would have been lost to me.

The following are the species added to the fauna during the year.

161. ROSE-COLOURED PASTOR, *Pastor roseus*.—An adult male in full plumage visited the island in the spring. A similar bird was reported, on good evidence, as having appeared in 1907.
162. GOLDEN ORIOLE, *Oriolus galbula*.—Was observed during both the passage periods. In spring one was found dead, but in a perfectly fresh condition, in a crevice in the face of the cliff, into which it had evidently crept for shelter, the weather at the time being very ungenial.
163. HAWFINCH, *Coccothraustes coccothraustes*.—A male visited the island in spring, and finding neither trees nor shrubs led a terrestrial life. It also had to descend to feeding on the dung of ponies—such are some of the shifts which have to be resorted to by migratory birds when journeying between their accustomed seasonal haunts.
164. TWO-BARRED CROSSBILL, *Loxia bifasciata*.—This is another spring visitor which found itself quite out of its natural surroundings and away from its ordinary food-supplies when at Fair Isle. It, too, was observed on the ground feeding on pony's dung. This Crossbill has only once previously been recorded for Scotland, namely, from the Orkney island of North Ronaldshay.
165. RUSTIC BUNTING, *Emberiza rustica*.—Single birds of this species appeared on both passages. The Rustic Bunting

has only once previously been known to visit Scotland, having occurred at Cape Wrath in the spring of 1906.

166. GREY WAGTAIL, *Motacilla melanope*.—This bird appeared in the spring. Since it does not nest in countries north of our islands, it is not surprising that it is only a casual visitor to the Orkneys and Shetlands.
167. BLUE-HEADED WAGTAIL, *Motacilla flava*.—The occurrence of this species is interesting, because with its appearance all the British species of Wagtails have occurred at Fair Isle. The Blue-headed Wagtail has been *recorded* for both the Orkney and Shetland groups; but the occurrences of this bird and the commoner, though much overlooked, *M. borealis* have been mixed in the past, and it is now quite impossible to say to which species most of the records refer. Both species are summer visitors to Scandinavia, but this is much the most uncommon of the two.
168. RED-THROATED PIPIT, *Anthus cervinus*.—I have long been on the look-out for this Pipit at Fair Isle, and had examined, with the aid of a field-glass, great numbers of Meadow Pipits in the hope of detecting it. During my last visit, however, this bird proclaimed its presence on two occasions by its notes, which are quite different from those of any other Pipit with which I am acquainted. There are very few reliable records of the visits of this bird to the British Isles, indicating perhaps that its routes to and from the north do not lie by way of our shores. It has not previously been recorded for Scotland.
169. RICHARD'S PIPIT, *Anthus richardi*.—Several of this summer visitor to central and southern Europe appeared on the island in the autumn. They frequented the crofts and open grass lands, and were extremely wary and difficult to approach. This species has only once previously been recorded for Scotland, namely, near Dunkeld in the early autumn of 1880.
170. SUBALPINE WARBLER, *Sylvia subalpina*.—The occurrence of this species at Fair Isle is one of the most interesting events of the year in the annals of British ornithology. That the second British specimen of this pretty little Warbler should, like the first, have occurred in one of the most remote of our islands seems, on first thoughts, somewhat strange. It must be remembered, however, that in such places, should there be any one there to observe them, these waifs are more likely to be detected than elsewhere. If this bird has visited St. Kilda and Fair Isle it must surely have occurred elsewhere with us.

171. BARRED WARBLER, *Sylvia nisoria*.—Several birds of this species occurred in the autumn, and were for the first time identified beyond a doubt. I had seen the species during a previous visit, and though pretty certain of the accuracy of the observation I refrained from placing it on record.
172. EVERSMAAN'S WARBLER, *Phylloscopus borealis*.—This new species to the British avifauna was chronicled in the last number of the "Annals." Though first recorded from Fair Isle it will be ascertained, by reference to p. 114 of the current number, that this species had previously occurred elsewhere in the Scottish Isles, but, alas, has hitherto passed under name of *P. irridanus*.
173. ICTERINE WARBLER, *Hypolais hypolais*.—Although this species is a summer visitor to Scandinavia, it is only occasionally detected on the British shores during the period of its passages between its summer and its winter haunts. It has not been previously recorded from any part of Scotland.
174. SAVI'S WARBLER, *Locustella luscinioides*.—The appearance of this species at Fair Isle during the spring must be regarded as one of the most interesting events in British ornithology for many years. This bird was formerly a summer visitor to the fens of East Anglia, but ceased to be a native bird over fifty years ago, and is not known to have visited us since. That it should have reappeared in Britain at a locality so far removed from its ancient English haunts is, indeed, most remarkable. Even Heligoland, with its unrivalled record for feathered rarities, cannot boast of having Savi's Warbler amongst its distinguished visitors. Needless to say, this bird has not hitherto been known to visit Scotland.
175. ALPINE ACCENTOR, *Accentor collaris*.—I saw a bird of this species, at close quarters, resting on the face of one of the great cliffs on the west side of the island. I might have shot it with ease, but had no desire to drop it into the Atlantic surf several hundreds of feet below. It flew off to another part of the cliff and was lost amid fastnesses so vast and unapproachable as to render observation quite impossible. Thousands of migrants, unfortunately, resort to this great range of precipices, and entirely baffle the efforts of the observer. This bird is new to the Scottish fauna.
176. COOT, *Fulica atra*.—Single birds appeared on several occasions during the spring and autumn. This species nests in the southern part of Shetland, and these visitors may have been wanderers from this colony, or migrants passing to and from it.

177. GREY LAG GOOSE, *Anser anser*.—"Grey Geese" appear every year, but are seldom satisfactorily identified. In 1908, however, several Grey Lags visited the island, and their identity was established beyond a doubt.
178. TUFTED DUCK, *Fuligula cristata*.—One or two appeared on migration, which is not very surprising since the bird is a summer visitor to Scandinavia. Fair Isle, however, offers no feeding resorts for the fresh-water diving ducks; but it is somewhat strange that we have not more information concerning the bird as a migrant in other isles of the Shetland group which afford suitable haunts: it is probably much overlooked.
179. GREY PLOVER, *Squatarola helvetica*.—This species, being essentially a shore bird during its visits to the British Isles, finds little or nothing suited to its requirements at Fair Isle, whose rock-bound coast-line offers little attractions for wading birds. The reefs at the south-western corner are the chief resort of the few shore birds that do alight, but this haunt is a most difficult one to explore, owing to its rugged nature, the out-crop of the strata being almost perpendicular, and their exposed edges irregular, sharp, and saw-like. I saw a single Grey Plover flying high over the island, and heard its familiar note. Though a flock of Golden Plover were on the wing at the time, and close at hand, this bird did not join it.
180. TEMMINCK'S STINT, *Tringa temmincki*.—The species must be considered a very rare visitor to Scotland, for it has only, I believe, been recorded for Aberdeenshire. It will be interesting to observe if it repeats its autumn appearance at Fair Isle.
181. WOOD SANDPIPER, *Totanus glareola*.—This is a not unexpected addition to the fauna of Fair Isle, for the bird is a common summer visitor to northern Europe. It has, however, not yet been detected on its passages elsewhere in Shetland, and has only once been recorded for Orkney.
182. GREENSHANK, *Totanus canescens*.—A single bird was observed for several days during the autumn. It haunted the reefs at the south-west corner of the island.
183. BAR-TAILED GODWIT, *Limosa lapponica*.—This is another of the waders which was not detected until the present year (1908). There is no reason to doubt that it occurs annually at the seasons of passage, but probably in only small numbers, as suitable feeding grounds are wanting.
184. BLACK-TAILED GODWIT, *Limosa limosa*.—One visited the island in mid-winter, and frequented a croft which was in a very moist condition at the time.

185. GREAT NORTHERN DIVER, *Colymbus glacialis*.—The Fair Isle seas are much affected by the strong tides which sweep along them on all sides; and this, along with the fact that there is little shelter in the shape of enclosed bays, may account for this bird being more or less uncommon, and have led to its having hitherto escaped notice. One was seen on several occasions during the winter of 1908.

ON THE OCCURRENCE OF BRÜNNICH'S GUILLEMOT IN THE FIRTH OF FORTH.

By WILLIAM EAGLE CLARKE, F.R.S.E., F.L.S.

ON 11th December 1908 a specimen of Brünnich's Guillemot (*Uria lomvia*) was picked up on the shore at Craigielaw Point, on the Haddingtonshire coast of the Firth of Forth, and sent to the Royal Scottish Museum by Mr. Valentine Knight. The bird had evidently been dead some little time, for it was in rather high condition, and had been mauled by gulls or crows. It was at once placed in strong spirit and allowed to remain there for several weeks, and has now, thanks to the skill of Mr. Hugh Mackay, been made into an excellent cabinet specimen.

The only other Scottish example of this arctic species is one discovered by Macgillivray about eighty years ago among some birds from Orkney in the collections at the University of Edinburgh. On the strength of this specimen, which is in full summer plumage and is still to be seen among the birds in the Collections in the Royal Scottish Museum, Brünnich's Guillemot was added to the British avifauna. Other specimens are said to have been obtained in Caithness, Sutherland, and Suffolk, but these occurrences cannot be regarded as entirely satisfactory. During the arctic winter of 1894-5, three examples were obtained on the Yorkshire coast and one in Cambridgeshire, and the claim of this bird to be regarded as British was thereby fully established. From that date until the finding of the present bird, no other specimen has been detected either in British waters or on our shores.

The bird under consideration is a female, and possesses all the characteristics of the species. It has a short, stout, curved bill, the basal portion of whose upper mandible is not overhung by plumes; the upper plumage is blue-black (showing a greenish hue in certain lights), except the medium and primary coverts, which are dark brown; the wing measures 8.45 ins. from the carpal joint, and the tarsus 1.4 ins. Judging from the size of its bill, which, measured along the curve of the culmen, is only 1.2 ins. in length, I consider it to be a bird of the year, that is to say, about five months old. There is no patch of white behind the eye, that tint on the sides of the head being confined to the region well below the eye and extending from the gape backwards. I mention this character specially, because the white patches on the side of the occiput are present in adult specimens of this species in winter plumage, and also in common Guillemots both young and old at that season. The Forth specimen resembles exactly the bird in the background figured on plate 40 of vol. vi. of Lord Lilford's "British Birds," except that its bill is more decidedly curved.

THE AQUATIC COLEOPTERA OF THE SOLWAY DISTRICT.

By FRANK BALFOUR-BROWNE, M.A. (Oxon.), F.R.S.E., F.Z.S.

PLATE I.

IN spite of the fact that so keen a collector as the late Mr. William Lennon spent his life in the district, and although the late Professor M'Nab did some collecting there, and Dr. Sharp also spent some years at Dumfries, very little has been published on the Coleoptera of the Solway district. In the bibliography I have included the only 14 papers which I have been able to find.

Dr. Sharp defined the Solway district as "the part drained by rivers between the Liddel and Culzean Castle" ("Col. of Scotland," 1871). This area includes the counties of Wigtown, Kirkcudbright, and Dumfries, part of Ayrshire,

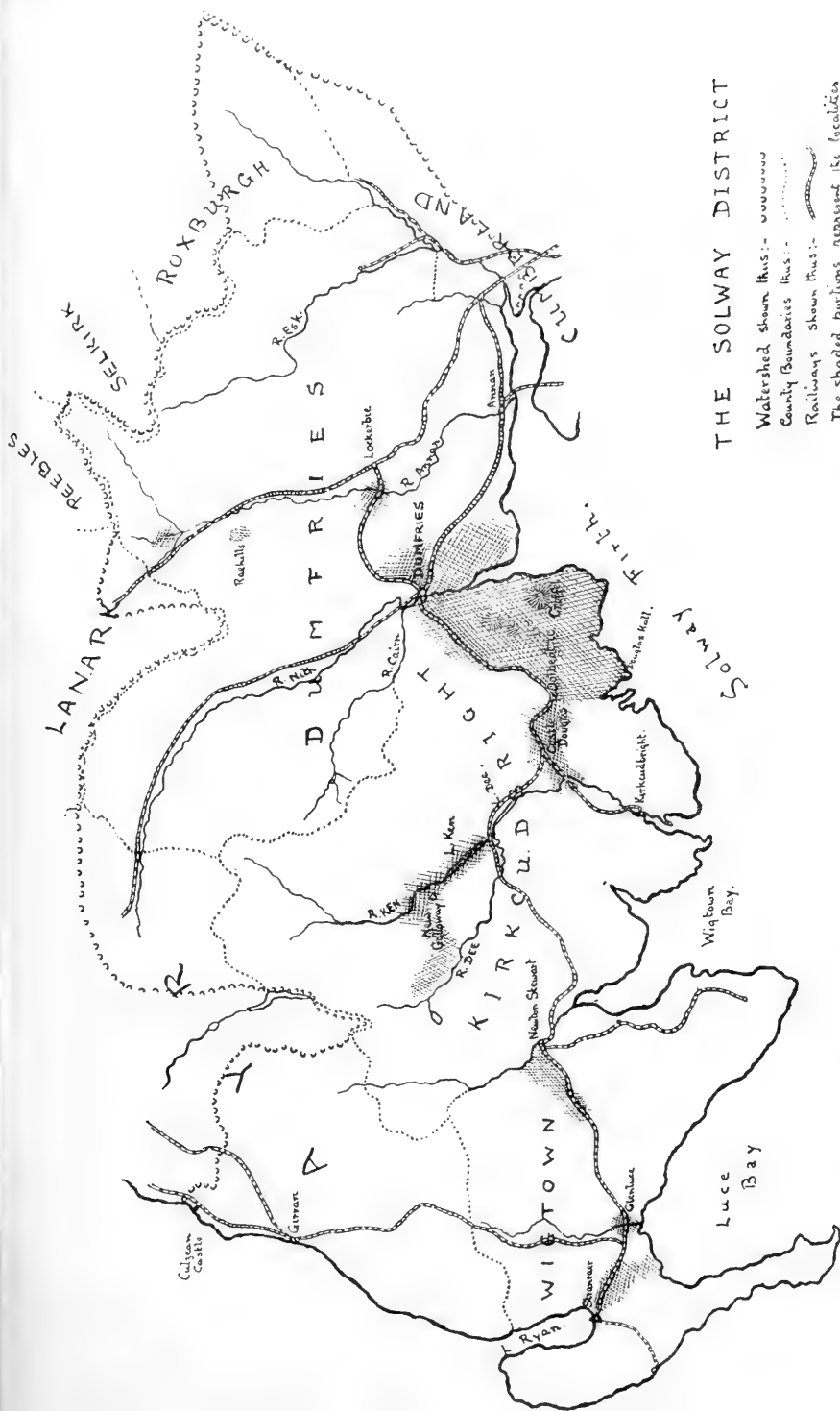
THE SOLWAY DISTRICT

Watershed shown this:- vvvvvvvv

County Boundaries thus:-

Railways shown thus:-

The shaded portions represent the localities where collections have been made





a small part of Lanark where the Eyan Water, a tributary of the Annan, has its source, a small corner of Roxburgh, and also a small portion of Cumberland and of Northumberland.

In the present paper I refer to the results of three years' work—so far as my own records are concerned ; and in view of the fact that the county and vice-county system of recording distribution, as originally laid down by Watson ("Cybele Britannica") is gradually being, and will I hope soon be universally, adopted by naturalists, I shall give a county reference for each species. Also in referring to the distribution in Great Britain or Ireland of any of the species, I shall adopt the same system which is used by Mr. J. W. Taylor in his "Monograph of the Land and Freshwater Mollusca of the British Isles," which is now appearing, the system which is officially recognised by the Conchological Society of Great Britain and Ireland.

In saying that my collecting in the district has covered three years I do not wish to convey the idea that I have spent three whole years at the work, but that on various occasions during that time I have visited the district and have spent most of the time of my visits hunting water-beetles. Most of my collecting has been done in Kirkcudbrightshire, but I have done a certain amount in Dumfriesshire, and much less in Wigtownshire, and on the accompanying map I have marked all the stations at which collections have been made. It will be seen from the map that a very small part of the whole district has been worked by me, so that, although my list contains 105 species, there are possibly others to be found in outlying parts. Although I have probably covered most of the ground worked by the earlier collectors I have failed to find several species recorded by them, some of which, I have no doubt, would have turned up if I had searched the right habitats. One gets into the habit of working certain kinds of ground and of, perhaps unconsciously, neglecting others, so that the results of any one collector are almost certain to be imperfect in some direction. I have entirely neglected the genera *Sphæridium*, *Cercyon*, *Megasternum*, and *Cryptopleurum*, which are, some chiefly, others entirely, terrestrial, so that few individuals turn up in the water-net.

Dr. Sharp ("Coleoptera of Scotland") gives a list of 88 species of water-beetles for the Solway district, and also mentions two species, *Hydroporus dorsalis*, F., and *Copelatus agilis*, F., as having been recorded, but as being doubtfully Scottish.

These species were both said to have been taken by the Rev. Wm. Little at Raehills, Dumfriesshire. The former species has apparently never turned up in Scotland since Little's time, but with regard to *C. agilis* there is a specimen in the Dublin Museum Collection labelled "Queensberry Hill," M'Nab! Now Queensberry Hill is within a few miles of Raehills, but it seems probable that M'Nab's specimen is not the one recorded by Little, because the date of Little's list containing his record is 1838, while the dates on M'Nab's specimens in the Dublin Museum—where, so far as I know, is all that remains of his collection—all run in the sixties and seventies, where any dates are given. This species has been recorded from England as far north as Lancs S., and Yorks N.E., S.W., and Mid W., but there are apparently no records for Cumberland or Northumberland, and the Dumfries records are the only Scottish ones.

Of the 88 species recorded by Dr. Sharp I have so far failed to find 12. These are:—*Haliphys striatus*, Sharp; *Celambus confluens*, F.; *Deronectes latus*, Steph.; *Lacophilus interruptus*, Panz.; *Gyrinus suffriani*, Scriba; *Berosus luridus*, L.; *Chaetarthria seminulum*, Herbst.; *Helophorus nubilus*, F.; *Hydræna testacea*, Curt.; *H. angustata*, Sturm.; *H. atricapilla*, Wat.; *H. pygmæa*, Wat.

Although I have worked both the Kelton and Caerlaverock salt marshes on numerous occasions I have not succeeded in finding *H. striatus*, Sharp. Sharp's record of *Celambus confluens*, F., is apparently founded on a "Raehills" record given by Andrew Murray. This latter author also recorded the species for Renfrew and Stirling. The Dumfries record is supported by the fact that Lennon (MS. List) mentions having taken one specimen in a brackish pool in Caerlaverock salt marsh,—a somewhat strange habitat for the species?—and one specimen is to be found in his collection, although it stood there as *C. versicolor*, Schall. I have never been fortunate enough to find

D. latus, Steph., anywhere up to the present, as I have seldom worked the rapid streams which it inhabits. It is apparently rare, and Lennon does not mention it in his lists, nor has he any Scottish specimens in his collection. Sharp's record for *Laccophilus interruptus*, Panz., appears to be the only published one, but I believe I can show in a round-about way that Lennon took one specimen of this species in the district. The only specimen of *Hydrovatus clypealis* in the Lennon Collection came, according to the Register, from Cambridge, although that species is only known to occur in the Isle of Wight and South Hants, while a single specimen of *L. interruptus* is registered as having come from Portsea, one of the localities where *H. clypealis* occurs (see 'W. W. Fowler,' and 'J. J. Walker,' "Vict. County History, Hampshire and Isle of Wight"). Now Lennon evidently mixed up *L. interruptus* and *obscurus*, for he says of the former species, "not uncommon in Auchencrieff Loch" (MS. List), and fills up the space in his cabinet with *L. obscurus*. Of this latter species he says "very rare. One specimen only in river Nith above Dumfries" (MS. List). He had also in his collection one specimen of *Laccophilus variegatus*, Germ., labelled Dumfries, although the species only occurs in the S.E. of England, and one specimen of *Bidessus geminus*, F., labelled "Dover." Now, if we change these labels about, so as to make them refer to their proper species, I think we shall find that—*Bidessus geminus*, F., came from Cambridge; *Laccophilus variegatus*, Germ., from Dover; *Hydrovatus clypealis*, Sharp, from Portsea; *Laccophilus obscurus*, Panz., from Auchencrieff Loch; *L. interruptus*, Panz., from river Nith above Dumfries. The river is just the place where, in a quiet backwater, one would expect to find *L. interruptus*!

Since Sharp's record of *Gyrinus suffriani*, Scriba, Lennon has taken it at Maxwelltown Loch, where possibly it is still to be found, but I have paid very little attention to the *Gyrinidæ*. *Berosus luridus*, L., is another of Little's Dumfries records, and there is apparently no other Scottish one, except that of Robert Hislop for Elgin, 1870, which is referred to by Sharp. The species is an "English" type, not otherwise having been recorded farther north than

Lincoln N. and Derby. There are several Scottish records for *Chætarthria seminulum*, Hbst., and I have taken the species in Ayrshire, but, so far, not in the Solway district. *Helophorus nubilus*, F., is recorded for various districts in Scotland, but, unlike most of the other members of the genus, it is more commonly taken on dry ground away from water, so that it is perhaps not so surprising that I have not come across it.

Hydræna testacea, Curt., again, is commoner in the south than in the north, though there are records for Cheshire and Yorks S.W. and Mid W. Lennon (MS. List) mentions having taken one specimen on the banks of the Cairn (Kirkcudbright), but whether this is the record Sharp refers to, I do not know. *H. angustata*, Sturm., should probably refer to *H. longior*, Rey., as it seems doubtful if the former species occurs in Britain (see Newberry, "EMM," ser. 2, xviii. 172-3, 1907). Although I have taken none of the three, *H. longior*, *atricapilla*, or *pygmaea*, in the Solway district, they are distributed throughout Scotland, and are not uncommon.

Sharp also mentions 19 species as probably occurring in the Solway district, although at that time he had no records of their occurrence. Of these I have found all except 6, which are:—*Ilybius obscurus*, Marsh; *I. guttiger*, Gyll.; *Gyrinus distinctus*, Aubé; *Helophorus rugosus*, Ol.; *Hydrochus brevis*, Herbst., *H. angustatus*, Germ. Lennon (MS. List) records *I. guttiger*, but he evidently intended *I. anescens*, Thoms., so that species, *Ilybius obscurus*, and *Gyrinus distinctus*, have not apparently fulfilled Dr. Sharp's expectations. Lennon, however, seems to have found both species of *Hydrochus*, *brevis* being "common in marshy parts of Maxwelltown loch" (MS. List), while one specimen of *angustatus* seems to have occurred at the same place ('Some Addits. to Scottish Coleoptera,' etc., "Ann. Scott. Nat. Hist." April 1892; also MS. List.) In his collection is a very full series of the former species (32 specimens), while there are two specimens of the latter, one labelled Mid-Solway and the other "Midlands." I have visited Maxwelltown Loch on many occasions, but have never seen these species. Possibly the conditions have changed so much that they have become

extinct, or possibly I have never been to the locality at the right season of the year !

Among Lennon's 42 specimens of so-called *Helophorus nubilus* are 27 which are in reality *H. porculus*, Bedel, only recently recognised as a British species (see Newberry, "EMM." ser. 2, xix., 88, 1908) and previously mixed with *H. rugosus*, Ol. They are all registered as Mid-Solway specimens, and Lennon describes them as "common in or near brackish pools, Kelton and Caerlaverock Salt Marshes."

Apart from any species already referred to, Lennon records 7 "Mid-Solway" species which I have not so far come across, and they are :—*Haliplus obliquus*, F. ; *Hydroporus neglectus*, Schaum ; *H. celatus*, Clark ; *Agabus biguttatus*, Ol. ; *Berosus spinosus*, Stev. ; *Helophorus tuberculatus*, Gyll. ; *Hydræna nigrita*, Germ. He records *Haliplus obliquus* as "very local and scarce," and says, "As yet I have only taken this species singly in the Glen Mill Burn" (Kirkcudbrightshire) (MS. List). Now in his collection are 7 specimens of *H. obliquus* and 1 of *H. confinis*, labelled "Mid-Solway," while another specimen of *H. confinis* is labelled "Earlswood, Surrey." In his Mid-Solway list he does not mention *H. confinis* which is now, whatever it was then, fairly common in Lochrutton Loch. Neither of these species is a "running-water" denizen, and the probability is that the specimens found by Lennon, whether of *H. obliquus* or *H. confinis*, were washed down by the floods from Lochrutton Loch ! There seems, however, no reason why *H. obliquus* should not have occurred as it is recorded from Cumberland, Northumberland S., and Berwick, and I have taken it very sparingly in both Fife and Forfar.

With regard to *Hydroporus neglectus*, Lennon (1895) records having found one specimen in Lochrutton Loch. This species is somewhat scarce, and very local in Britain, having apparently only been recorded from Kent W., and Surrey, Norfolk E., and Staffs, and Yorks N.E., Mid W., and N.W., and I am inclined to doubt the Solway record, the more especially as the specimen is not in the Lennon collection.

There is no reason to doubt the record of *H. celatus*, Clark, although specimens representing this species in

Lennon's collection are all *H. morio*, Dey. There are, however, 3 specimens of *celatus* in the collection which were labelled *morio*.

With regard to *Agabus biguttatus*, Ol., there is room for comment.

In his collection Lennon has 18 specimens representing this species, all of which were *A. guttatus*, Payk; while among 15 specimens representing *A. guttatus*, and all registered "Mid-Solway," were 3 specimens of *A. biguttatus*. In his MS. List Lennon says of *A. biguttatus* that it is "local but not uncommon in small clear-running streams," while in "Some Addits. to the Scott. Coll.," 1892, written jointly by him and Mr. W. Robinson Douglas, the species is described as "common, Orchardton, W.D.R.D." Mr. Robinson Douglas very kindly allowed me to examine the water-beetles in his collection, and all his so-called *A. biguttatus* turned out to be *A. guttatus*! The two species are, I think, often mixed by collectors, and I think that a number of the records of *biguttatus* really refer to *guttatus*. The late Mr. Arthur Chitty allowed me to examine the specimens which he took at Loch Awe and at Forres, and recorded as *A. biguttatus* ("EMM.," ser. 2, iii. 216, 1892; "Ann. Scott. Nat. Hist.," ii. 119, 1893; and "EMM.," ser. 2, iv. 68-71, 1893), and they were all *A. guttatus*, Payk.

The species is really easily distinguished from *guttatus* by several characters. First in the ♂ of *biguttatus* the anterior claw of the anterior tarsi is toothed, while in *guttatus* there is no tooth. Secondly, the palpi are usually pitchy in *biguttatus*, and usually testaceous in *guttatus*, but this is not an altogether reliable character as occasionally *guttatus* has rather dark palpi. If, however, the elytra are examined under a high-power lens a difference between the two species is quite evident. In *biguttatus* the surface is smooth and finely reticulate without any punctures in the reticulation, while in *guttatus*, where the lines of the reticulation cross one another there is a puncture. Thus *guttatus* is reticulate and punctate while *biguttatus* is reticulate and impunctate! Sometimes the punctuation of *guttatus* is so well marked that the specimen appears punctate even under low magnification, e.g., some of the specimens in the Power Collection—but as

a rule it requires a high-power lens to make out the punctures. On the strength of the 3 specimens labelled "Mid-Solway" occurring in the Lennon Collection I shall include the *biguttatus* in the Solway List.

A note of the occurrence of *Berosus spinosus*, Stev., in the Caerlaverock Salt Marshes ("Ann. Scott. Nat. Hist.," April 1892) is certainly startling in view of the fact that the recorded distribution of this species in Great Britain is entirely eastern, the records being for Yorks N.E., Norfolk W., Suffolk E., Essex S. and N., Kent E., Sussex E., and Hants, S. Unfortunately, however, there are no specimens of this species in the collection, but there is a full series of *B. signaticollis*, Charp., on Lennon's original cards marked along the base with a blue line to show their Scottish origin. This species is not altogether eastern in its British range since there are records for Cornwall (E. or W.?) and Glamorgan. Otherwise its records are for Sussex E., Kent E. and W., Surrey, Middlesex, Suffolk E., Norfolk E., Cambs, and Yorks Mid W. In view of the fact that two or three other southern British species occur in the Solway district, this record is interesting.

There is no doubt as to the correctness of the records for the rare species *Helophorus tuberculatus*, Gyll. Two specimens occur in the Collection, and were recorded in "EMM." xvi. 134, 1879-80, and in "Ann. Scott. Nat. Hist.," April 1892.

The record of *Hydræna nigrita*, Germ, is interesting. Lennon (MS. List) refers to the species as "local and somewhat scarce. Muddy banks of the Glen burn," but only one specimen with the "Scottish" mark is in his Collection. There are, however, more recent records for Ayr (Anderson Fergusson, 'Coleoptera' in "Handbook of Nat. Hist. of Glasgow and the West of Scotland," p. 279, 1901), and for Mull (Ebudes Mid.), (MS. List of T. H. Beare), which are the only western Scottish records.

From what I have seen in some collections I am not sure that all the records for this species really refer to it, or whether some of them are not for dark specimens of *H. riparia*, Kug. In my experience *H. nigrita* is rare; in fact the only place I have so far taken it is at Ballycarry,

Co. Antrim. I have, however, seen specimens from Norfolk (Chitty), Stirling (Power), S. Wales (Chitty), and Sussex E., so that it appears to be fairly well distributed.

With regard to Little's records, I have already referred to the fact that *Hydroporus dorsalis* has not been taken in Scotland since his time. The absence of this species from Scotland is extraordinary, as it is a species with a decidedly northern distribution in Euro-Asia ranging to Finland and Siberia. In England it apparently occurs as far north as Northumberland S., but on the west it has not yet been recorded north of Cheshire, although it has been taken in all the five vice-counties of York. Until recently the species had not been taken in Ireland. The first record is to be found in the supplement to 'The Beetles of Ireland,' by Messrs. Johnson and Halbert ("Proc. Roy. Irish Acad." vi., ser. 3, 1901), where it is mentioned as having been taken by the late Mr. Buckle "in the Lagan Canal in Moira," evidently while the paper was in the press. The species turned up again in Co. Down in 1904 (W. F. Johnson, "Ir. Nat.," xiii. 93, 1904), and I have recently (1908) taken it sparingly in various places in the northern part of that county. In October last the Rev. W. F. Johnson and I found it in abundance in various places near Armagh, where he is quite certain the species did not occur 13 years ago when he lived in that district and worked it thoroughly (v. "Ir. Nat.," xviii. 72, 1909). The only other Irish specimen or specimens I have seen are from Tonabrocky, Galway, W. (collected, I believe, by Mr. Halbert in 1904), but apart from these occurrences the species is not recorded from Ireland. Thus the "Britannic" distribution of the species is extraordinary, and although it is apparently spreading in the NE. of Ireland it seems unable to reach Scotland.

One other record by Little given by Andrew Murray (1853) calls for remark, and that is for *Hydroporus halensis*, F., said to have been taken at "Raehills." Otherwise, with three exceptions, the records for this species are entirely eastern. Essex N., Suffolk E., Norfolk E., Cambs, Lincs N., Notts, Lancs S., and Cumberland. The Notts record is for a single specimen taken by the Rev. Alfred Thornley in

November 1895, which I have seen. The Lancs S. record is given by Mr. W. E. Sharp for Bolton ("Vict. County History, Lancs," 1906), and there is a "local" specimen in the Reston Collection in the Manchester Museum. The Cumberland record is given as "Carlisle, T. C. Heysham," in the "Vict. County History," 1901.

There are very few records for this species even in the eastern counties. It was common in Norfolk E. many years ago near Brundall Station, where it was taken by Dr. Sharp, and in 1904-5 it swarmed at the Palling Brick Pits in the same vice-county, but it gradually got scarcer so that in 1906 it was hard to find. The localities, "Horning, Stalham, and Brundall are given by Edwards (Norfolk Coleoptera, "Trans. Norf. and Norw. Nat. Soc.," 1893), and there is a "Ranworth" specimen in the Power Collection.

The species was first taken in Suffolk (Garney's "Ent. Annual," 1865, p. 40), and other records for that county are mentioned by Morley ("Col. of Suffolk," 1899). The Cambridge record is for a specimen or specimens taken at Horseway by Mr. J. F. Dutton, who kindly sent me a list of his captures, and the Essex record rests upon the capture of "several in shallow pools in a ballast pit" (B. S. Harwood, "EMM." xxxv. 72, 1899).

Thus Suffolk and Norfolk seem to be the centre of this species in Britain as they are the only counties from which there is, so far, more than one record, and the occurrence of specimens so far away as Lancs and Cumberland—and perhaps Dumfries—seems to have been due to chance.

There seems to be no record of *Agabus uliginosus* having occurred in the Solway district. Sharp mentions records for Forth and Dee districts, quoting from Murray's "Catalogue":—"Rare, near Edinburgh; Aberdeenshire," and then says—"I think it probable that individuals of *A. congener*, Thunb., were mistaken for this species. *A. uliginosus*, however, has been found in Northumberland, so that it may ultimately prove to be a Scottish species." This species has since occurred in Cumberland as I learn from Mr. F. H. Day (who has kindly sent me a list of additions to the Cumberland list given in the "Victoria County History," 1901), and in the Dublin Museum Collection there is a

specimen marked "Tinwald Downs" (M'Nab), which brings the species into Dumfriesshire.

The Solway List of Water-beetles includes, then, about 120 species, which is rather more than half the total number of species known in Great Britain. I have left *Haliphus fluviatilis* and *straitus* standing as species, although I am not altogether satisfied that they are really distinct from *H. ruficollis*, De G. I have, however, come to the conclusion that *Hydrobius picicrus*, Thoms., is a mere variety of *H. fuscipes*, L. I have also neglected *H. immaculatus*, Gerh., recently introduced as "a species or variety" to the British List [Newbery, "EMM.," ser. 2, xviii. 4, 1907]. Of this total I have taken 101 species in Kirkcudbrightshire, and about 10 others recorded by Sharp and Lennon are from the same county.

(*To be continued.*)

COLEOPTERA FROM MOLES' NESTS IN THE SOUTH-EAST OF SCOTLAND.

By Prof. T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S.,
and WILLIAM EVANS, F.R.S.E.

THE success which has recently attended the search for Beetles in moles' nests in the south of England, induced us a year ago to see what this same method of collecting would produce north of the Tweed. Accordingly, we made a beginning on 19th February 1908, and in the course of the past twelve months a hundred moles' nests, all seemingly in use, have been examined in the neighbourhood of Edinburgh. A record was kept of the beetles found in each, and it is here reproduced in the hope that the particulars may be of interest to Coleopterists working at this subject. The observations were made in the months of February, March, April, May, and November 1908, and January and February 1909. We wish now that they had been continued throughout the year.

Of the 100 nests examined, 29 did not yield any Beetles or their larvæ, while 12 contained larvæ only. In the re-

maining 59 nests there were found 180 Beetles (fully 3 per nest), exclusive of larvæ, belonging to 24 species. The largest number in any one nest was 10. Of the species obtained, only 4, all *Staphylinidæ*, namely, *Aleochara spadicea*, Er., *Oxytoda longipes*, Muls., *Quedius longicornis*, Kr., and *Q. vexans*, Epp., belong to the group of 9 taken in England, which are considered by Mr. N. H. Joy to be peculiar to moles' nests.¹ So far we have seen no signs of any of the other 5, namely, *Homalota paradoxa*, Rey, *Heterothops nigra*, Kr., *Quedius nigrocæruleus*, Rey, *Medon castaneus*, Gr., and *Hister marginatus*, Er. The absence of the *Heterothops* is especially noteworthy in view of its abundance in nests in the south of England. The *Hister* has been taken in a mole's nest in Ross-shire by Mr. Joy, so that its detection here is probably only a question of time.

With us the most common species is probably *Aleochara spadicea*,² which was present in 19 nests, and next to it comes *Quedius vexans*, detected in 18 nests. *Q. longicornis* is much scarcer (taken in 10 nests), while *Oxytoda longipes* occurred in only 8 nests, two of them in the locality (near Aberlady) where the first British specimen was captured by Dr. Sharp (but not in a mole's nest) many years ago.

The other Beetles, most of them doubtless only casual visitors, found in the nests were:—*Dyschirius globosus*, Herbst., *Metabletus foveolatus*, Gyll., *Megasternum boletophagum*, Marsh., *Aleochara cuniculorum*, Kr., *Homalota* (3 species), *Tachyporus hypnorum*, F., *Tachinus collaris*, Grav., *Xantholinus linearis*, Ol., *X. ochraceus*, Gyll., *Othius myrmecophilus*, Kies., *Stenus speculator*, Er., *S. pusillus*, Er., *S. brunnipes*, Steph., *Oxytelus sculpturatus*, Grav., *Choleva angustata*, F., *C. tristis*, Panz., *Catops sericeus*, F., and *Trichopteryx*, sp. ?.

Besides the Beetles there were present in the nests many other creatures—Fleas and their larvæ, Diptera and their larvæ, Springtails, Spiders, Mites, Myriapods, and Enchytræid Worms—upon most of which the Staphylinids no doubt prey.

¹ "Ent. Mo. Mag." Nov. 1908, p. 246.

² First taken in Scotland in a mole's nest in Peeblesshire, March 1905 (Evans, "Ann. Scot. Nat. Hist.," 1908, p. 120).

PARTICULARS OF MOLES' NESTS EXAMINED.

Near Largo, Fife, 19th February 1908, 12 nests examined by T. H. B. and W. E. ; sandy soil.

- 1st nest, Blank.
- 2nd nest, *Quedius longicornis*, 2.
- 3rd nest, *Oxyptoda longipes*, 2.
- 4th nest, *Quedius longicornis*, 1 ; *Aleochara cuniculorum*, 2.
- 5th nest, A few Staphylinid larvæ only.
- 6th nest, *Aleochara spadicea*, 4.
- 7th nest, *Aleochara spadicea*, 2 ; *Choleva angustata*, 3.
- 8th nest, *Quedius longicornis*, 1 ; and *Quedius* larvæ, 4.
- 9th nest, Blank.
- 10th nest, *Homalota*, sp.?, 3.
- 11th nest, *Catops sericeus*, 1.
- 12th nest, Blank.

Gullane, Haddingtonshire, 5th March 1908, 6 nests examined by W. E. ; sandy soil.

- 1st nest, *Quedius longicornis*, 1.
- 2nd nest, *Quedius vexans*, 1.
- 3rd nest, *Aleochara spadicea*, 1, and 2 Staphylinid larvæ.
- 4th nest, *Aleochara cuniculorum*, 1.
- 5th nest, *Homalota*, 2 sp., 7.
- 6th nest, *Choleva tristis*, 4.

Near Dirleton, Haddingtonshire, 14th March 1908, 13 nests examined by T. H. B. and W. E. ; sandy soil.

- 1st nest, *Quedius longicornis*, 1 ; *Q. vexans*, 1 ; *Aleochara spadicea*, 6 ; *Homalota*, sp.?, 2.
- 2nd nest, A few *Quedius* larvæ only.
- 3rd nest, *Quedius vexans*, 2, and several *Quedius* larvæ ; *Homalota*, 2 sp., 2 ; *Megasternum boletophagum*, 1 ; *Trichopteryx*, sp.?, 2.
- 4th nest, *Quedius vexans*, 2 ; *Aleochara spadicea*, 2 ; *Choleva angustata*, 1.
- 5th nest, *Quedius longicornis*, 2 ; *Xantholinus linearis*, 1.
- 6th nest, *Quedius vexans*, 3, and larvæ ; *Homalota*, sp.?, 1.
- 7th nest, Blank.
- 8th nest, *Aleochara spadicea*, 1 ; *Homalota*, sp.?, 2.
- 9th nest, *Quedius vexans*, 1 ; *Aleochara spadicea*, 6 ; and several Staphylinid larvæ.
- 10th nest, Two *Quedius* larvæ only.
- 11th, 12th, and 13th nests, Blank.

Links near Largo, 21st March 1908 ; 12 nests examined by W. E. ; sandy soil.

- 1st nest, *Aleochara spadicea*, 1.
- 2nd nest, Blank.
- 3rd nest, *Homalota*, sp.?, 1.
- 4th nest, Blank.
- 5th nest, *Aleochara spadicea*, 1, and larva.
- 6th nest, *Aleochara spadicea*, 2.
- 7th nest, One *Quedius* larva.
- 8th nest, *Aleochara spadicea*, 5.
- 9th nest, *Aleochara spadicea*, 1.
- 10th nest, Blank.
- 11th nest, *Quedius longicornis*, 1.
- 12th nest, Blank.



Ravelrig Toll Moss, 28th March 1908, 5 nests examined by W. E.; damp peaty soil.

- 1st and 2nd nests, Blank.
- 3rd nest, *Othius myrmecophilus*, 1.
- 4th and 5th nests, Blank, but for 1 Staphylinid larva.

Upland pastures, 2-3 miles south of Leadburn, Peeblesshire, 4th April 1908; 11 nests examined by W. E.; clayey and peaty soil.

- 1st nest, Blank.
- 2nd nest, *Quedius vexans*, 2.
- 3rd nest, Blank.
- 4th nest, *Othius myrmecophilus*, 1.
- 5th nest, Only some smallish Staphylinid (*Aleochara*?) larvæ.
- 6th nest, Blank.
- 7th nest, *Quedius longicornis*, 3.
- 8th nest, *Quedius vexans*, 4, and larva.
- 9th nest, *Quedius vexans*, 6, and larva.
- 10th nest, Two larvæ of *Quedius*.
- 11th nest, Blank.

Luffness Links, near Aberlady, Haddingtonshire, 8th April 1908; 12 nests examined by T. H. B. and W. E.; sandy soil.

- 1st nest, *Stenus brunnipes*, 1; *Homalota*, sp.?, 2.
- 2nd nest, *Homalota*, sp., 1; *Trichopteryx*, sp.?, 3; and several *Quedius* larvæ.
- 3rd nest, Blank.
- 4th nest, *Tachinus collaris*, 1; *Tachyporus hypnorum*, 1; and several Staphylinid larvæ.
- 5th nest, *Quedius vexans*, 3; *Aleochara spadicea*, 4; *Homalota*, sp. 1; and many larvæ of *Quedius* and *Aleochara*.
- 6th nest, *Quedius vexans*, 2, and several larvæ; *Oxyptoda longipes*, 2; *Aleochara spadicea*, 2; *Choleva angustata*, 1.

7th nest, *Aleochara spadicea*, 1; several larvæ of *Aleochara*, and one of *Quedius*.

8th nest, *Stenus pusillus*, 1, and *Quedius* larva.

9th nest, *Aleochara spadicea*, 1; *Homalota*, sp.?, 1; *Stenus speculator*, 1; and several *Quedius* larvæ.

10th nest, *Quedius vexans*, 1; *Homalota*, sp.?, 1; and many *Quedius* larvæ.

11th nest, Only one larva of *Aleochara*?, and a dead mole!.

12th nest, *Oxytoda longipes*, 1; *Aleochara spadicea*, 2; *Oxytelus sculpturatus*, 2; *Homalota*, sp.?, 5.

Near Elie, Fife, 11th April 1908; 10 nests examined by W. E.; light sandy earth.

1st nest, Blank.

2nd nest, *Oxytoda longipes*, 1.

3rd to 9th nests, Blank, except for a few *Quedius* and other larvæ.

10th nest, *Quedius longicornis*, 1.

Luffness, 2nd May 1908; 3 nests examined by W. E.; sandy soil.

1st and 2nd nests, Blank.

3rd nest, *Metabletus foveolatus*, 2; *Homalota*, sp.?, 1.

Dirleton, 9th May 1908, one nest examined by W. E.; light earthy soil.

In nest—*Dyschirius globosus*, 1; *Quedius vexans*, 1, and 2 larvæ.

Fullarton, Midlothian, 5th November 1908; 5 nests examined by W. E.; soil more or less peaty.

1st nest, *Quedius vexans*, 2 (♂ and ♀), and a Staphylinid larva.

2nd and 3rd nests, Blank.

4th nest, *Oxytoda longipes*, 1.

5th nest, Blank.

Luffness Links, 7th November 1908; 1 nest examined by W. E.; sandy soil.

In nest—*Xantholinus ochraceus*, 1, and a Staphylinid larva.

Dirleton Links, 9th January 1909; 2 nests examined by W. E.; soil very sandy.

1st nest, *Quedius vexans*, 1; and 4 *Quedius* larvæ.

2nd nest, *Quedius vexans*, 1; and 2 *Quedius* larvæ.

Near Bathgate, Linlithgowshire, 6th February 1909; 7 nests examined by W. E.; clayey and peaty soil.

- 1st nest, *Oxyptoda longipes*, 1; *Aleochara spadicea*, 1; *Homalota*, sp.?, 1.
 2nd nest, 4 *Quedius* larvæ.
 3rd nest, *Oxyptoda longipes*, 2.
 4th nest, *Quedius longicornis*, 3.
 5th nest, *Oxyptoda longipes*, 2; *Homalota*, 2 sp., 3.
 6th nest, *Quedius vexans*, 1
 7th nest, *Quedius vexans*, 4; *Aleochara spadicea*, 4; and a few larvæ.

EDINBURGH, February 1909.

ON SOME SCOTTISH DIPTERA—STRATIO- MYIDÆ TO ASILIDÆ.

BY A. E. J. CARTER and Rev. JAMES WATERSTON, B.D., B.SC.

THE publication of Mr. Verrall's recent work (vol. v. of "British Diptera") is an event of first-rate importance for every student of the families dealt with. The book must long remain the standard work.

We have taken the opportunity thus afforded of thoroughly revising the specimens of the above group in our collections. The results are contained in the present paper.

Many of the examples here mentioned have passed under Mr. Verrall's critical eye, one or two have already been included in Mr. Grimshaw's lists of the "Forth" Diptera. Some repeat or confirm old records. But for the sake of completeness and because members of the Stratiomyidæ, etc., except in the case of one or two common forms, are seldom met with abundantly, it has seemed best to notice all the species we have secured. The bulk of our captures have been made in the last seven or eight years.

In indicating localities the county name has been added to the first mention of the place, but dropped later. Field notes have been as a rule initialed. For any other remarks we are jointly responsible.

STRATIOMYIDÆ.

OXYCERA DIVES, Lw.—3 ♂♂, Aberfoyle, Perthshire. 6, 8, and 9, vii. '03. This species is very rare in Britain, and Mr. Verrall only knows of four or five specimens—a ♀ without

locality in the old Entomological Club collection, a ♂ recorded from Rannoch in 1898, and the 3 ♂ ♂ mentioned here. "At rest on Bracken" (C.).

- O. *TRIILINEATA*, *F.*—♂ and two ♀ ♀, Aberlady, East Lothian, 29, vi. '05.

NEMOTELUS ULIGINOSUS, *L.* } All three from Aberlady. *Uliginosus*
 ,, NOTATUS, *Ztt.* } and *notatus* are common and occur
 ,, NIGRINUS, *Fln.* } together. We have continuous records from 1902-1905 inclusive, the dates ranging from June to August. *Nigrinus* is distinctly scarcer than its congeners, and has been taken by us only in June. "On flowers of Ranunculus" (W.).

- SARGUS FLAVIPES, *Mg.*—♀, Musselburgh, Midlothian, 29, viii. '01. Both sexes, Aberfoyle, 25-29, viii. '06. ♀, Aberlady, 6, viii. '04. The last is a small example barely 7.5 mm. in length.

- S. CUPRARIUS, *L.*—Musselburgh, "fairly common in July and August" (C.). ♀, Blackford Hill, Edinburgh, 18, vii. '04.

- S. IRIDATUS, *Scop.*—2 ♂ ♂, Aberfoyle, 30, vi. '04; ♀, *ibid.* 8, vii. '03. ♀, Musselburgh, 18, viii. '04. ♀, Colinton, Midlothian, 12, ix. '05; ♀, Comrie, Perthshire, 11, vii. '07.

- CHLOROMYIA FORMOSA, *Scop.*—♂, Comrie, 27, vi. 1900; ♂, St. Boswells, Roxburghshire, 7, vii. '02; ♂, Blackford Hill, 18, vii. '04.

- MICROCHRYSA POLITA, *L.*—Musselburgh; Comrie; and Blairgowrie, Perthshire. "Common" (C.). Two ♀ ♀, Bavelaw Burn, Midlothian, 1, vii. '04; ♂, Dunvegan, and also at Uig, Island of Skye, June 1905-1906 respectively.

- M. FLAVICORNIS, *Mg.*—♀, Loch Tay, Perthshire, 2, vii. '04; ♂, Blackford Hill, 18, vii. '04; ♀, Arniston, Midlothian, 17, vii. '06; ♂, Aberdour, Fifeshire, 7, vi. '04.

- M. CYANEIVENTRIS, *Ztt.*—Occurs sometimes in large numbers. Taken in June and July, 1902-1908, Taynult (Argyllshire), Comrie, Blairgowrie, Bavelaw Burn, Aberdour, St. Boswells.

- BERIS VALLATA, *Forst.*—In June and July from Bavelaw Burn, Iona, Blackford Hill, Musselburgh, and Comrie (1902-1907); never more than one or two examples. But the species was common at Aberlady, 7, viii. '05, where it occurred on nettles in company with a species of sawfly, coloured almost exactly like itself (C.). ♀, Small Isles, Jura, first week of Sept., 1907.

- B. GENICULATA, *Curt.*—Not a common species in Britain, but the "Forth" area appears to be one of its strongholds. In view of the interest attaching to it we give our records in full. 11, vii.

'02, ♂, Bavelaw Burn; 21, vii. '02, 2 ♂♂, Blackford Hill; *ibid.*, 18, vii. '04, 9 ♂♂, 5 ♀♀; 29, vii. '04, ♂; 6, vii. '06, ♀; 15, vii. '04, ♂, Royal Botanic Garden, Edinburgh; 22, vii. '04, ♂, St. Boswells; 6, viii. '04, 2 ♀♀, Aberlady; 17, vii. '06, 4 ♂♂, Arniston; 28, vii. '06, Musselburgh, "in some numbers" (C.), and "most years in August and September" (C.); 6, viii. '06, ♀, Polton. Recorded "A.S.N.H.," January 1904, p. 32, as *B. fuscipes* Mg., a species neither of us has yet been fortunate enough to secure. Mr. Verrall gives only five recent English records, and Musselburgh, Perth, and Golspie, in Scotland.

B. CHALYBEATA, *Forst.*—A fairly common species. Taken as early as May at Musselburgh; chiefly, however, in June and July (1902-1908). From the following localities,—Winchburgh (West Lothian), Polton (Midlothian), Blairgowrie, Balerno, Lochgelly (Fifeshire), Loch Tay.

B. MORISII, *Dale.*—2 ♀♀, Arniston, 17, vii. '06; ♀, Polton, 6, viii. '06. Not a common species; the only Scotch records given by Mr. Verrall are Ballater and Logie.

LEPTIDÆ.

LEPTIS SCOLOPACEA, *L.*—Aberlady, Musselburgh, Aberfoyle, Comrie, Blairgowrie, West Calder (Midlothian), Lochgelly. Also in June 1905, both sexes, at Balelone, N. Uist, Outer Hebrides, and June 1906, at Uig, in Skye (♂ only).

L. NOTATA, *Mg.*—♂, Musselburgh, 11, vi. '04; 2 ♂♂, Polton, 9, vi. '06. "The Musselburgh specimen is the only one taken there during several years collecting in the locality" (C.). According to Mr. Verrall, it is a mountain species.

L. TRINGARIA, *L.*—Frequently met with, chiefly in July and August, Lochearnhead (Perthshire), Comrie, Blairgowrie, Aberfoyle, Blackford Hill, Musselburgh, Arniston, Broughton, and Stobo (Peeblesshire). "A very dark ♂, taken near Edinburgh, but hardly *nigriventris*" (W.).

L. LINEOLA, *F.*—The commonest of the genus, June to Sept. 1902-1908. Blackford Hill, Polton, Arniston, Midcalder, Aberlady, Aberfoyle, Blairgowrie, Comrie, Callander, Loch Tay, Whiting Bay (Arran), Small Isles, Jura. "A ♂, Blairgowrie, 12, vii. '08, is very much darker than typical examples" (C.).

ATHERIX IBIS, *F.*—♀, Comrie, 26, vi. '07; 3 ♀♀ on the Earn, near Crieff, Perthshire, 3, vi. '08. "Standing fishing in the middle of the river I saw a large number of these flies come down stream in a continuous string. They settled one after another on my waders—at the same spot" (W.). The remark-

able egg-laying habit of this species is well known. The ♀ ♀ cluster together, lay their eggs and die. The cluster, which is continually receiving new accessions and may contain thousands of dead flies, is attached to boughs overhanging streams. The larvæ hatch out and fall into the water. The above field-note may refer to this peculiar habit.

SYMPHOROMYIA CRASSICORNIS, *Pz.*—2 ♂ ♂, Comrie, 7, vii. '07.
“At rest on palings” (C.).

CHRYSOPILUS CRISTATUS, *F.*—(Formerly in our list as *C. auratus*, *F.*) A common species. Found especially near water. The ♂ ♂ outnumber the ♀ ♀. Taken chiefly in July. Blackford Hill; Bonally near Colinton; Musselburgh; Longniddry; Aberlady; Aberdour; St. Boswells; Loch Tay; Aberfoyle; Comrie; Blairgowrie; also in June 1906 at Uig, Skye.

PTIOLINA ATRA, *Staeg* (= *nigra*, *Ztt.*).—21 and 24, v. '04, on each occasion a single ♂, Luffness, Aberlady. “By sweeping the herbage of marshy pools” (W.). The first British records. In addition to these specimens Mr. Verrall records it from Brodie (Elgin), Bonhill (Dumbartonshire), and Porthcawl (Glamorgan), apparently a rare species.

SPANIA NIGRA, *Mg.*—♀, St. Fillans, Perthshire, 16, vii. '07.
“Taken by sweeping under trees near the Loch” (C.). This is the ♀ referred to by Mr. Verrall in his description, “I have had only one good specimen before me for examination,” p. 318.

TABANIDÆ.

HÆMATOPOTA PLUVIALIS, *L.*—The “cleg,” sometimes a pest at midsummer. Our records range from April to September. We have the ♀ from Aberlady, Aberfoyle, Comrie, Blairgowrie, and Jura; and the ♂ from Whiting Bay, Arran (1); and Hirta, St. Kilda (common).

H. CRASSICORNIS, *Whlbg.*—Several ♀ ♀ at Aberfoyle, July 1901 and 1903. No doubt often passed over through its resemblance to the previous species.

THERIOPECTES DISTINGUENDUS, *Verr.*—Several ♀ ♀, Aberfoyle, July 1901, 1903, 1904. ♀, Comrie, 18, vii. '07. “♀ given me by Mr. Godfrey. Taken before 1901. No data. Perthshire?” (W.). Hitherto not separated from *T. solstitialis*, *Mg.*, under which name the Aberfoyle specimens were recorded in “E.M.M.” 1905, p. 163, and again in “A.S.N.H.,” 1904, p. 32.

ATYLOTUS FULVUS, *Mg.*—♀, Aberfoyle, 3, vii. '01. A rare species. Banchory is the only other Scotch locality given by Mr. Verrall.

TABANUS SUDETICUS, *Zeller.*—“♂ and ♀, the latter dated '8, vii. '01.” The ♂ was received from Mr. Godfrey and probably

the ♀ also. One or other I believe occurred at Lochearn-head" (W.).

♂, Aberfoyle 7, vii. '03 } "The ♂ at rest on Bracken, the
♀, ,, 28, viii. '06 { ♀ one of three that settled on my
coat at the same time! Near the top of Craigmore" (C.).

T. CORDIGER, *W.*—2 ♀ ♀, Comrie, 17 and 18, vii. '07. "Appears to be an uncommon British species," Verrall, p. 416.

CHRYSOPS RELICTA, *Mg.*—♀, Aberfoyle, 10, vii. '01; 4 ♂ ♂, 3 ♀ ♀, Blairgowrie, 28, vi. '08. "The latter specimens taken on the leaves of shrubs, etc., growing round a curling pond. The next day none were to be seen" (C.).

BOMBYLIDÆ.

BOMBYLIUS MAJOR, *L.*—♀ on Primula, near a pond at Inverawe House, Argyllshire, 18, iv. '03. The species of this genus appear to be rare in Scotland.

ANTHRAX PANISCUS, *Rossi.*—♂, Aberlady, 6, vii. '04. Aberlady is the only Scotch locality given by Mr. Verrall.

THEREVIDÆ.

THEREVA NOBILITATA, *F.*—♂, Musselburgh, 2, vii. '02; 2 ♂ ♂, Longniddry, 3, viii. '03. Both sexes at Aberlady, '03 and '04. ♀, Blackford Hill, 6, viii. '06. In the last specimen the venation is peculiar. The lowest vein from the discal cell is partially defective in both wings. Mr. Verrall calls attention to a ♂ from Cambridge with this character in the right wing (p. 561). One of the Aberlady ♀ ♀ has the fourth posterior cell open. It is usually closed in this species.

T. ANNULATA, *F.*—"♂ from Tentsmuir, Fifeshire. Taken about June 1898, and given me by its captor, Mr. A. J. D. Lothian" (W.). Aberlady, 27, vi. '02. "In some numbers" (C.). Longniddry, 2 ♂ ♂, 9, viii. '02.

ASILIDÆ.

DYSMACHUS TRIGONUS, *Mg.*—♀, Tentsmuir. Taken by Mr. Lothian, June 1898. A widely distributed species; but Mr. Verrall gives only Kingussie, Irvine Moor, and Troon as Scotch localities.

ISOPOGON BREVIROSTRIS, *Mg.*—♂, Aberfoyle, 7, vii. '03. "Both sexes in some numbers in Glen Lednock, Comrie, July 1907. Taken in coitû" (C.).



DIOCTRIA GELANDICA, L.—♀, Comrie, 7, vii. '07. Mr. Verrall gives no Scotch localities, but there is an old record in Mr. Grimshaw's 'List of "Forth" Diptera,' "A.S.N.H.," 1903, p. 162.

D. RUFIPES, Deg.—18 and 27, vii. '04; five examples in all, ♂ ♂. Blackford Hill. "Taken by thoroughly sweeping the nettle patches above the Hermitage on the hill-side" (W.).

ON THE BRITISH PLANT LISTS AND THEIR DISCREPANCIES.

By G. CLARIDGE DRUCE, M.A., F.L.S.

(Continued from 1908, p. 242.)

505 and 506. *Oxalis stricta* and *corniculata*, L. In the "List of British Seed Plants," Rendle and Britten have followed the example of Dr. Robinson ("Journ. Bot.," 1907, 386) and reversed the above names, using *stricta* for the prostrate and *corniculata* for the erect species. The "London Catalogue" and my List keep to the names as they have been, without exception (till Dr. Robinson's innovation), used by botanists since Linnæus founded them. The confusion which would result if such a change were sanctioned would be so great as to render a trinomial necessary; but I hold that Dr. Robinson has not got over the essential point, *i.e.*, the description, as given in the "Species Plantarum" of *O. corniculata*, caule ramoso diffuso, pedunculis umbelliferis. Now Linnæus could not have had *stricta* before him when he wrote this description, which is not applicable to it. It is a rule, supported, I believe, by all botanists, that the description is the essential part in establishing a species, and that references to plates and synonymy are secondary. But Linnæus cites "*Trifolium luteum minus repens, etiam procumbens*" (Moris. "Hist.," 2, p. 183, t. 17, f. 2), which is certainly not *strictum*; and Dr. Bucknall and Mr. J. W. White agree in naming the specimen in the Morisonian Herbarium *O. corniculata*, so that the only figure definitely cited does not refer to *stricta*. It is quite likely Linnæus may have muddled the two species; but the definition caule ramoso diffuso, wherever it may have been

taken from, does not apply to *O. stricta* ; and to quote it for that plant is misleading.

Again, under *O. stricta*, Linnæus has caule ramoso erecto, which does not apply to *corniculata* ; and his reference to *S. acetosum corniculatum luteum majus rectum indicum s. virgineum* (Morison's "Hist.," 2, p. 184, t. 17, f. 3) is again to a figure which does not represent *corniculata*. The specimen in Hb. Morison is also *O. stricta*, L. Therefore I still contend that we may continue to use these as heretofore.

No. 619. In "Flora Salop," Leighton, in describing *Trifolium striatum*, L., var. *erectum*, cites Gaspar as the author, but perhaps not as published by him. In full, the citation should doubtless be var. *erectum* Gaspar, *ex* Leighton.

705. *Vicia tetrasperma*, Moench. Fries established his var. *tenuifolium* under *Ervum* (Fries' "Nov.," p. 12, 1814), quoting *Ervum tenuifolium*, Lagasc., and *E. tenuissimum*, Pers. In the "Flora of Berkshire" I described it as *V. gemella*, var. *tenuissima*, altering the name *tenuifolium* because there was already a *V. tenuifolia* established. If the pertinence of the varietal name had been made obligatory we might have had to use var. *tenuifolia*. But the point is, Fries did not write *tenuissima*.

746. *Spiræa Ulmaria*, L., var. *denudata*, Boenn. Mr. Britten has ridiculed the claims of this variety, and draws support from a statement, not however based upon extensive experience, of one of his correspondents. So far as my experience goes, it is a fairly well-defined variety occupying distinct areas, and is by no means a diseased form. If it were a Hawkweed it would probably have been described as a "good species."

908. *Potentilla palustris*, Scop. Herr Wolf, in his recent "Monograph of the genus *Potentilla*," keeps up the variety *villosa* (Lehm). Although intermediate conditions are found, yet the extreme form is very distinct.

943. *Rosa villosa*, L., which I retain, because I do not follow the Vienna rules, is also used in the British Museum "List," in defiance of them.

937. *Rosa Eglanteria*, L. This is certainly the Sweet-briar, as established in the first edition of the "Species Plantarum," not of Herb. In the second edition Linnæus

confused, or rather perhaps replaced, it with the yellow rose. There is no need to cite Hudson. M. Crépin says *Rosa Hailstoni* of Baker belongs to *dumalis*, and the var. *Nicholsoni*, Christ, belongs to the *involuta* group. M. Crépin also says *R. caesia*, Sm. = *R. corrifolia*, Fries ; but I do not think Ley or Wolley-Dod agrees with this. Crépin was quite confident about it. He also referred Baker's *celcrata* to *R. glauca*, Vill.

958 bis. *Pyrus semipinnata*, Roth. I omitted this as being always a planted tree ; but I have since added it as an alien.

966. *Cratægus Oxyacantha*, L. This is well represented by several sheets in the "Linnean Herbarium," all being what I call true *C. Oxyacantha*, L., i.e. *monogyna*, Jacq.; which is really, I hold, synonymous. This species has much the widest European range, and alone extends to Norway and Sweden. The description in "Sp. Pl." would cover both species ; but the habitat and synonyms belong to the one-styled plant. Our second species is *C. oxyacanthoides*, Thuill., which is essentially a plant of Central and Eastern England, scarcely reaching Scotland, except perhaps as an introduced plant. I have never seen it there. It appears to be absent from the Channel Isles. When the two species grow together hybrids are very frequent. Such an area is Wychword, Oxfordshire, where, as in Whittlebury Forest, Northamptonshire, the old thorns are often *oxyacanthoides*. This plant, although sometimes growing in upland places, rejoices in the clayey soil of river-valleys.

1141. *Siler trilobum*, Crantz, is now extinct near Cambridge.

1267. *Filago germanica*, L. "Syst. Nat.," ed. x., 1235, 1759, is, according to Mr. Britten, the authority ; but Mr. F. N. Williams ("Prod. Fl. Britt.," p. 18) says the plant of the "Systema" is not *F. germanica*, and refers to "Sp. Pl.," ed. 2, p. 1311, 1763 ; but if he is correct about the "Systema," Hudson is the authority, as given in my List.

1385. Surely *Petasites ovatus*, Hill, must stand. Linnæus had *T. hybrida* the female, and *T. Petasites* the male plant. One being synonymous with the other, the choice of his still-born name seems singularly unfortunate. To

make a name applied to a unisexual segregate the authoritative appellative for a species, and to take rank over a properly-applied binominal name, appears to stretch even a "Vienna rule" to breaking point. If Linnæus did not understand the species, there is no reason to perpetuate his name by miscalling our Butterbur *Petasites hybridus*, which it is not.

1274. *Gnaphalium uliginosum*, L., var. b. *pilulare* (Wahl.). Here again, I think, Mr. Fryer's observations ("Journ. Bot." (1889), 83), which may have been quite correct so far as they went, cannot be said to be more than suggestive. In the place where I found it the plants were quite normal; they grew with the type, and there was nothing to account for their variation so far as soil or situation went. I may say at that period I examined many hundreds of specimens, so evidently the variation is rare with us. I commend further research to our active botanists.

Genus 335. *Arctium*.—I am afraid all three Lists are wrong in their treatment of this genus. I followed Mr. F. N. Williams ("Prod. Fl. Britt," 54) in treating our Burdock as *A. intermedium*, Lange, and as he stated that he and Mr. Bennett did not agree that our *nemorosum* was what was understood by Continental authors, he therefore distinguished it as a variety of *intermedium* under the name *Newbouldii*. He gave no citation to show that this had been established by Mr. Bennett either as a species or variety. I referred to the "Journ. Bot.," 1899, p. 342, but there the name was only given by Mr. Bennett as to be used under certain contingencies, and seems apparently to me to be invalid; therefore when raising Mr. Williams's variety to a species, I was the authority. However, it appears Mr. Bennett had elsewhere ("Irish Nat.," 1903, p. 289) published the name with some diagnostic characters; and if the name could be retained it must be cited as of Arth. Bennett. Mr. W. H. Beeby has ("Journ. Bot.," 1908, p. 380) contributed a valuable note in which he shows that both Mr. Bennett and Mr. F. N. Williams are wrong; that *A. nemorosum*, Lej., is British (it is the plant with agglomerated, almost sessile heads, at the apex of the principal stems), and that *A. intermedium*, Lange, is partly made up of *A. Lappa* × *minus*, and partly

of *A. minus*, var. *purpurascens*, Blytt. What the *A. pubens*, Bab. (which represents Lange's *intermedium* in "Brit. Mus. List"; see "Journ. Bot.," 1907, p. 439), is, has yet to be ascertained. Mr. Beeby doubts if we have any fourth species to represent it in Britain.

Genus 337. *Cirsium* [Tourn.], Hill, 1756; Scop., 1760. In the first edition of the "Species Plantarum," the genus *Cnicus* was given on p. 826 in a footnote, which is unindexed, and included *C. benedictus* as well as species of *Carduus* and *Cirsium*. The genus *Cnicus*, L., is usually on the Continent used to designate *benedictus*; and Tournefort's genus *Cirsium*, revived by Hill in 1756 and Scopoli in 1760, which Linnæus had wantonly ignored, is now in general use, with the exception of Bentham and Hooker and British botanists, for the plume thistles. In fact, the Vienna rules say *Carbenia*, Adans. (*Fam.* ii. (1763), 116), must be replaced by *Cnicus*, Gärtn. ("Fruct." ii. 1791, 385) [but why not *Cnicus*, L., "Sp. Pl." 1753, sens. ampl. ?]; and in a footnote they add: "*Cnicus*, L., 'Sp. Pl.' (1753), 826, amplexitur et *Cnicum*, Gärtneri, et *Cirsium*, Adans., Em. DC. Genere Gärtneriano recepto genus homonymum Linnæanum interdum pro nomine usitato '*Cirsium*' adhibitum (cf. Benth. and Hook. f., *Gen.* ii. 1873, 468) rejiciendum est; itaque valet *Cirsium*, Adans." As I have said, both the "Lond. Cat." and "Brit. Mus. List" profess to follow the Vienna rules, but in this instance have not done so. The Law of Priority seems to be best carried out in using *Cirsium* for our Plume Thistles, as is done by Mr. F. N. Williams, and in my List.

Genus 340. *Silybum* is quoted in both "Brit. Mus. List" and "Catalogue" as of Vaillant; but that author is pre-Linnean. Adanson revived it in 1763 after Hill had established *Mariana*.

1702. *Azalea procumbens*, L., is retained by Mr. Britten because he "does not understand the Vienna rules, which conserve *Loiseleuria*, to mean that Linnæus' genus *Azalea* must disappear, which it would do if *A. procumbens* were not retained." This seems something like special pleading. When Bentham and Hooker united *Sinapis* with *Brassica*, the Linnean genus *Sinapis* disappeared, and the

murmurs were few. If our mountain plant is a *Loiseleuria*, and that name has to be retained, it follows that *Azalea*, L., disappears. The "Index Kewensis" says *Azalea*, L. = *Rhododendron*, L. The point appears to be, Does the definition of the Linnean genus *Azalea* cover our Scottish plant? If so, I should prefer to use it; but those who follow the Vienna rules must surely accept the "nomina conservanda," and these include *Loiseleuria*; Kuntze wished to call it *Chamæcistus*, Oeder; and the Vienna rules seem specially designed, in this and other cases, to prevent his name being accepted, since they specifically reject Oeder's name, which, it is true, had no generic description in the "Flora Danica" in 1761. S. F. Gray tried to revive it in 1821. It is a monotypic genus. Babington pleaded strongly for the retention of *Azalea procumbens*, L.

1757 bis. *Centaureum tenuiflorum* (Hoffmg. and Link, as a sp. of *Erythræa*). I followed Mr. Townsend in putting it to *C. pulchellum*. In the last edition of the "Flora of Hampshire," p. 255, he treats it as a distinct species, and on a *Euphrasia* standard doubtless it is so. Curiously, Nyman thought it was synonymous with Smith's *latifolia*. I think the Rev. E. S. Marshall has made a slip in saying that Nyman makes it a sub-species of *E. linariifolia*, Pers. = *E. litoralis*, Fries. The only sub-species they have is Grisebach's *E. tenuifolia*, not *tenuiflora*, Hoffmg. and Link.

1763. *Gentiana Amarella*, L. In this [2] is misplaced in my List. It should obviously follow the British census number.

1843. *Cuscuta racemosa*, Mart.; an older name is *C. suaveolens*, Seringe.

1892. *Scrophularia aquatica*, L. The var. *c.*, *bracteata*, belongs to *nodosa*. It was accidentally transferred to the wrong species in my List. The variety bears much resemblance to *S. alata*, Gilib.

1940 bis. *Euphrasia*. Recently Miss Saunders has found *E. minima*, Jacq., on Exmoor in Somerset. C. H. Ostenfeld refers *E. paludosa*, *E. foulaensis*, and *E. scotica* to *E. minima*; and makes the following observations, additions, and corrections to the "List of the Phanerogamæ and Pteridophyta of the Faeroes," p. 845: "Wettstein considers

E. scotica to be very near *E. minima*, and says ('Mon. Euph.' 171) that the only difference of importance lies in the length of the capsule in proportion to the calyx, but adds that he does not know if this difference is constant. Shortly after Townsend ('Mon.' p. 426) declared that it is not constant, as he has found specimens of *E. scotica* with capsules exceeding the calyx; he says that a marked distinction seems to lie in the form of the upper leaves and bracts of *E. scotica*, which are narrower than those of *E. minima* and have a cuneate base. I have examined many hundreds of specimens of *E. scotica* from Scotland, Shetland, and the Faeroes, and have compared them with many specimens of *E. minima* both from the Alps and Scandinavia, and I cannot find any distinction which holds good. I feel pretty sure that the Scottish, etc., plant is identical with true *E. minima*. Townsend, who has seen a good deal of my Faeroese material, has determined many specimens with capsules exceeding the calyx as *E. scotica*, specimens which are quite like the typical *E. minima* from the Alps. As pointed out by R. Wettstein ('Mon.' 159), *E. minima* varies much with regard to the colour of the corolla; the true *E. scotica* represents a form with pale or whitish flowers (f. *pallida*, Gremli); but from this we find all possible variations of colour until a form with dark purple corolla (f. *purpurascens*, Wettst.) . . . it is the same form which has been described as *E. foulaensis*, Towns., *apud* Wettstein. I have examined Mr. W. H. Beeby's specimens from Hamnafeld on Foula, upon which F. Townsend has made his description, and they are after my opinion only rather coarse, unbranched *E. minima* with dark purple corollas and long capsules; the specimens were found among heather, and this explains their somewhat flexuose stem. Both Wettstein and Townsend compare it with *E. latifolia*, Pursh; but it is easily distinguished from it by its nearly glabrous leaves; common to both forms are the obtuse teeth of the leaves and bracts. The same form has been described in 1870 by E. Rostrup ('Faeroernes Flora,' p. 48) as *E. gracilis*, f. *atropurpurea*, Rostr., which consequently is the name to be used. I have seen Rostrup's specimens (from Hestö), and found them almost identical with Beeby's specimens of *E. foulaensis*. The synonymy of the form is,

then, as follows :—*E. minima*, Jacq., f. *atropurpurea* (Rostr.) = *E. minima*, f. *purpurascens*, Wettst. = *E. foulacensis*, Towns."

1953. *Rhinanthus Perrieri*, Chabert, in "Bull. de l'Herb. Boiss." 1899 (Or. g), p. 512. Dr. von Sterneck ("Mon. der Gattung *Alectorolophus*," p. 108, 1901), while quoting in synonymy the above name for his *rusticulus*, says: "Die Exemplare von Modäne beschreib Chabert, a.a. O, unter dem Namen *Rhin. Perrieri* und stütze die Begründung der neuen Art einzig und allein auf das Anwachsen der Corolla in Laufe der Anthese. Die übrigen die neue Sippe charakterisierenden Merkmale (der kurze Stengel, die 'Calyces aenochroi,' die mangelnde Verzweigung) deuten direct ihre Stellung in der monticolen Formenreihe, somit ihre Identität mit *A. rusticulus* an."

Therefore, as he also alludes to *R. Perrieri* under *A. minor*, I followed Sterneck in choosing *rusticulus* as the specific name (for which we are also indebted to Chabert), since a species, founded primarily on a character possessed only in common with other species of the genus as is *Perrieri*, cannot be cited.

(To be continued.)

ON THE FLORA OF SHETLAND.

By WILLIAM H. BEEBY, F.L.S.

LAST year attention was devoted to the central portion of the main isle, a part which I had been unable to visit before. Although there is a good deal of limestone in this district and I had anticipated that the flora might exhibit some interesting features, the country did not prove very productive. Three long ranges of hills, the Easter Kame, Mid Kame, and Wester Kame, run parallel for miles. Their average height may be called 400-500 feet, with many higher points, the highest, Scallafeld, in the Wester Kame, reaching 921 feet. For a long distance the ridges are but a quarter of a mile apart, so the valleys are narrow. A limestone dyke runs along the whole length of the Weisdale valley, but it is mostly covered with surface soil which

affords fine pasturage. This is so well looked after by the sheep that there is not much left for any other collector.

New Shetland records are marked *.

Sagina Linnæi, Presl.—This plant must be expunged from the Shetland List. It was recorded partly on my own, partly on another determination; but the plants prove to be a form of *S. subulata*. I had suspected this, and it is now confirmed by Dr. Ostenfeld.

Montia lamprosperma, Cham.; Syn. *M. rivularis* auct. nonnull. (non Gmelin).—This is a new name, rather than a “new British plant,” as it has been called. In his last article in the “Botany of the Faroes” (iii. 853) Dr. Ostenfeld, following Dr. Harald Lindberg, adopts the above name in place of *M. rivularis*, on the sufficient ground that Gmelin did not describe the seeds. In consequence of this omission, we find that *M. rivularis* is variously placed by different authors. On proceeding to examine my material, both British and foreign, I found that the separation of *M. fontana* into two forms was not quite the simple matter that I had supposed it to be; for we have, in Britain, three distinct forms of seed which may be characterised as follows:—

1. Seeds entirely covered with large coarse tubercles, and quite without reticulations; black, dull or slightly shining.
2. Seeds covered on their face with rather coarse reticulations, but with about three rows of much smaller and more conical tubercles on each side of the keel, which is also minutely tuberculate; black and perhaps rather more shining.
3. Seeds entirely covered with fine reticulations which are a good deal longer and narrower than those of form 2; black, or more usually dark brown or purplish brown, polished, and quite without tubercles.

I propose the following arrangement of these forms; the counties named are those whence I have specimens, and must not be taken to represent their distribution or comparative rarity.

Montia fontana, L.

ssp. *minor*, Gmelin.

var. *a. chondrosperma*, Fenzl ap. Ledeb. (syn. *M. fontana*, Cham. in “Linnæa,” 1831, pl. 7, fig. 1.; *M. fontana*, var. *minor*, Syme). Seed form No. 1.—Surrey.

b. intermedia, Beeby ined. (syn. *M. fontana*, var. *minor*, “Bab. Man.”; *M. rivularis*, Garcke?). Seed form No. 2.—Cornwall W., Surrey.

ssp. *lamprosperma*, Chamisso, *l.c.* pl. 7, fig. 2 (syn. *M. fontana*, var. *major*, Bab. ; *M. fontana*, var. *rivularis*, Syme).
Seed form No. 3.—Shetland.

I think there is very little doubt that Syme's var. *rivularis* is the same as *M. lamprosperma*, but his description of the fine reticulations as "flattened tubercles" is perhaps hardly happy. He describes the seeds as larger, "more inclining to claret-colour," and shining.

I take no account of the land and water states of these plants, since they are merely temporary conditions directly induced by the environment, and not varieties.

I have not seen the original description of var. *chondrosperma*, Fenzl, and for the meantime have relied on that given by Rouy and Foucaud—"Graines opaques, fortement tuberculeuse."

Arctium minus, Bernh.—I have now been able definitely to identify, as above, the plant recorded as "*A. intermedium*, Lange?" ("Scott. Nat." 1891, p. 28.)

**Taraxacum spectabile*, Dalhst., ssp. *Geirhildæ*, Beeby, ined.—Differs from the type in the leaves being always undivided, whether growing among long herbage or on bare ground. (In the type they are undivided when among herbage but deeply lobed when on bare ground). After sixteen months' cultivation on bare ground the plants have never borne a lobed leaf, although the whole-leaved state of the type quickly assumes the bare-ground state, with lobed leaves, under similar conditions. The leaves are also of a much paler, yellower green, thus contrasting strongly with the dark brown-red midrib. The flowers are one-fifth to one-fourth more in diameter than those of the type when grown side by side; of a darker (brownier) yellow; and copiously furnished with pollen, while the type is epolliniferous. The phyllaries and fruits are similar to those of the type.

The name has indirect reference to one of the localities, the Loch of Girsta, formerly Geirhildarstadr; here Geirhild, Hrafna Floke's daughter, was drowned when accompanying her father on his voyage to Iceland about the year 870, as we are told in Landnámabok.

The sub-species occurs plentifully on rock ledges, among heather, and in grassy places by the east side of Lang Klödi Loch, Northmaven; also among rocks and heather by the Loch of Girsta, and elsewhere in Nesting and Weisdale.

I have always found the type to be pollenless until this year, when I found pollen-grains on the stigmas; but as the pot was standing next to that containing the ssp. *Geirhildæ*, it is possible that the pollen had been conveyed by insects.

Euphrasia.—In the “Botany of the Faeroes” (iii. 845-7) Ostenfeld has made important changes in the arrangement of the Faeroean species; and as these are the same as those found in Shetland, his conclusions, based on the examination of many hundreds of the specimens from the Faeroes, Shetland, Scotland, and the continent demand our attention. Dr. Ostenfeld now unites *E. scotica*, Wettst., *E. foulaënsis*, Towns., and the Faeroean “*E. latifolia*” (which is obviously not the same as the Scottish plant) under the name *E. minima* Jacq. It would occupy too much space to quote Ostenfeld’s arguments, and reference must be made to his article; but I am strongly disposed to accept his conclusions, especially regarding the identity of *E. scotica* and *E. foulaënsis*, as I have long been unable to separate these two plants, and specimens which I considered quite the same as the Foula plant, and which were sent to Townsend a few years after gathering the original *Foulaënsis*, were returned to me named *E. scotica*.

Rhinanthus stenophyllus, Schur.—Under this autumnal variety of *Rh. minor* I should place plants from the following localities:—Cornfield, Baltasound, Unst.; borders of oatfield, Sand Voe, Northmaven; Walls; cornfield, Clousta, and by Clousta Voe.—Mr. Marshall has kindly looked through my plants, and while he would place some of the above under *Rh. stenophyllus*, he expresses a little doubt in other cases; if, however, the presence of intercalary leaves is the important character that it is said to be, I think that they should stand under the above form.

**Salix cinerea*, L.—This is an addition to the list, Edmondston’s Gluss Burn plant having proved to be *S. aurita*. (“Scott. Nat.” 1890, p. 216.) It occurs abundantly on a holm in the Muckle Mill Loch of Uyea, Northmaven, and I think that it occurs on holms in Clubbi Shuns, but owing to the depth of the water I could not get near enough to make certain.

Iris pseud-acorus, L.—The summer of 1908 having been “the finest for twenty years,” I was at first much surprised to find no vestige of bud, flower, or fruit, although the plant was plentiful. The previous summer, however, was just the reverse, in fact it was quite “Faeroe weather,” Scotch mist alternating with rain and little or no sun; so that the soil was continuously in a cold sodden state, and evidently the Iris was unable to ripen its shoots in that year, and consequently it did not flower in 1908. For the same reason the Orchids did not flower; and although *O. maculata*, var. *ericetorum*, occurred everywhere among the heather, none was seen in flower.

Triglochin maritimum, L.—In a small bog by the Kergord Burn, alt. c. 35 m., and two and a half miles from the sea. Apparently very rare in Britain in truly inland situations.

Scirpus lacustris, L.—Since I first saw this plant in Sandwater Loch when driving past, some fifteen years ago, it has increased greatly, and huge beds of it now occupy much of the lower half of the loch. I was surprised to learn on the testimony of several old inhabitants that some thirty years ago the plant was entirely unknown there. It is first recorded from this locality by Peter White, in Tudor's "The Orkneys and Shetland," 1883. Local opinion attributes its introduction to the flocks of swans which rest on the loch during migration, and as the southward migration of the common Shetland species, *Cygnus musicus*, corresponds with the time when the fruit of the *Scirpus* is ripe, this may perhaps be the explanation. The nuts may have been brought from the Loch of Lund, Unst, where the plant has been known since 1837.

**Cystopteris fragilis*, Bernh.—This long-expected fern was found in some abundance on a group of limestone rocks on the Pettawater Burn, about half-way between Pettawater and Sandwater.

The Comparison of the Shetland and Faeroe Lists.—A short time ago ("Annals" 1907, p. 165) I made reference to some discrepancies in the "Supplement to Top. Botany" affecting Shetland, but Mr. Bennett has apparently been content to rely on his imperfect record as the basis of comparison with the plants of the Faeroes. There are various mistakes in Mr. Bennett's article (No. 67. pp. 36-40), the correction of which involves a reduction of eighteen per cent in the number of Shetland absentees given on page 39.

There is no need to regard too seriously Mr. Bennett's Shetland exclusions when one half of them appear as inclusions in his Supplement referred to; and it will suffice to say that after making allowance for

1. An initial wrong count,
2. Six Shetland species excluded,
3. Two extra-Faeroean plants interpolated, and
4. One species wrongly accredited to Shetland,

there is found to be, on balance, a reduction of nine, so that the number of species occurring in the Faeroes, etc., but not in Shetland, is brought down to forty instead of forty-nine.

I am chiefly concerned to maintain the accuracy of the Shetland List; and I do not know how the other vice-counties have fared further than that their lists will certainly bear revising.

There are several omissions from the short list of extra-British plants found in the Faeroes.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND
FERNS FOUND AT A THOUSAND METRES AND
UPWARDS ON THE MOUNTAINS OF THE BRITISH
ISLES, WITH AUTHENTIC REFERENCES AND CRITI-
CAL NOTES.

By FREDERIC N. WILLIAMS, F.L.S.

(Continued from p. 36.)

Fam. 22. SAXIFRAGACEÆ—Continued.

70. *Saxifraga cernua*, L.—First recorded as a British plant by R. Townson, who found it on alpine rocks on the summit of Ben Lawers, in 1790 (Hooker, "Fl. Scotica"); but the earliest printed record is in 1794, "amongst the rocks on the summit of Ben Lawers" (J. Dickson in "Trans. Linn. Soc." ii. 290); from which elevation there are also examples in herb. Smith (*ex* herb. A. Bruce, 1805) and in Herb. Brit. (R. Brown, 1793, J. Carroll, 1864), and from the same mountain, height not stated (G. Don, 1794, G. Horn, 1876, G. F. Hampson, 1893). Recorded also from Ben Lawers on the authority of J. Dickson (Smith, "Fl. Britannica," 453 [1800]). "It is to be hoped that botanists, when taking specimens, will bear in mind that the limited station on Ben Lawers is the only place in Britain for this plant" ("Fl. Perthsh." 141). Rock-soil schistose. In considerable quantity near the top of Ben Lawers, in 1905 (E. Cleminshaw, in Rep. Watson Bot. Exch. Club, ii. 52); previous observers stating that the plant is almost extinct.

71. *Saxifraga hirta*, J. Donn (1809).—Near the summit of Macgillicuddy's Reeks (J. T. Mackay in "Trans. Roy. Irish Acad." xiv. [1825], where it was found in 1805. The figure in Smith's "English Botany," t. 2291, was published two years afterwards, on June 1, 1811; and was drawn from a garden specimen supplied by Joseph Woods.

Syn. *S. Sternbergii*, W. (1809), *S. hypnoides*, var. *Sternbergii*, "Cyb. Hib." ed. 2, 131.

S. hirta, Haworth, "Syn. Plant. Succ." (1812) = *S. sponhemica*.

72. *Saxifraga rivularis*, L.—Alpine streams and wet rocks. Earliest record as a British plant on Ben Nevis, where it was found by R. Townson in 1790 (J. E. Smith, in Linn. "Fl. Lapponica," ed. 2, 143 [1792]; and in herb. Smith, Townson, 1790, also Turner and Hooker, 1807. Ascends to 1067 m. on Ben Lawers; "it is still there, but in very small quantity" ("Fl. Perthsh." 141). Ben Nevis; gathered at an elevation of 1006 m. "in a spot irrigated,

while the plant is in flower, by water trickling from the melting snow shortly above; also on the northern declivity of the adjacent Red Cairn Hill, in a spot upon which the snow probably lies till July," and which is at an elevation of 1100 m. ("Cyb. Brit." i. 413). On the eastern precipice of Loch-na-gar, and on the west side at the height where *Carex leporina* grows (Dickie, 66). Northern precipices of Cairn Gorm, at 1190 m. (A. Ley, 1874, n. 541, in Herb. Brit.). Cairn Toul, at 1100 m. E. S. Marshall, 1886, in Herb. Brit.). Aonach Beg, above 915 m. (E. S. Marshall, 1896, in Herb. Brit.). Stob-Coire-an-Easain, at 1037 m. (E. S. Marshall, in "Journ. Bot." 1897, 67).

73. *Saxifraga cæspitosa*, L.—A rare plant found high up on alpine rocks. Messrs. Groves ("Bab. Man." ed. 9) omit any reference to Scottish mountains, except the vague area "Aberdeenshire." Mr. E. S. Marshall ("Journ. Bot." *loc.*), however, says,—“The true plant was obtained on one of the Glen Spean mountains, very scarce and small; we believe that the locality is one in which it was met with by some Scottish botanists a few years ago.” This locality is in Inverness-shire. In Herb. Linn. one specimen under this name is from Idwal Lake in Caernarvonshire; the other specimen is quite a different plant, without any note about its origin. The Linnean description is somewhat vague, and may be applied to several distinct plants.

74. *Saxifraga nivalis*, L.—First recorded as a British plant “on Snowdon hill,” 1666 (Merrett, “Pinax Rerum Nat. Brit.” 111), where it is found on alpine rocks. Found in clefts of alpine rocks up to the summit of Ben Lawers (“Fl. Perthsh.” 142), where its usual position lies between 732-915 m. (“Cyb. Brit.” i. 408). Stob-Coire-an-Easain, at 1037 m. (E. S. Marshall, in “Journ. Bot.” 1897, 67). “On rocks on Ben Lawers” (G. Don, 1794).

75. *Saxifraga stellaris*, L.—This plant reaches the highest point possible in the British Isles; it grows at the base of the cairn erected on the summit of Ben Nevis, where John Sadler in 1876 found a single very small plant (“Trans. Proc. Bot. Soc.” Edinb. xiii. 53 [1878]):—“At a short distance above the spring, or about 3500 feet, phanerogamic vegetation and soil almost wholly disappear, only lichens and a few mosses are seen on the large blocks of porphyry with which the upper part of the mountain is covered.” Common in the Silurian area. Found in alpine marshy places up to the summits of Ben Lawers and Ben Alder (“Fl. Perthsh.” 142). Brought down by water in the Breadalbane district to 90 m. above sea-level. First recorded as a British plant under the name of “*Cotyledon hirsuta* sive *Sedum petraeum hirsutum*” in 1641, “upon the moyst Rockes at Snowdon” (Johnson, “Merc. Bot.” ii. 19). Beside the cairn on the summit of Ben Macdhui (Dickie, p. xxiii., but not referred to under the species on p. 64). “Flowering close

to patches of snow unmelted in July or August" (Watson, "Outlines Geograph. Distrib. Brit. Pl." 1832, p. 157). Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). Summit of Ben Avon (Wm. Gardiner, 1844, in Herb. Brit.—dwarf state). One of the most generally distributed of our arctic or alpine species; and exclusively limited to the mountainous districts on wet rocks and marshy places by mountain rills. On the north side of Carn Tual, from 229 m. to the summit. Descends to 150 m. in Donegal ("Cyb. Hib." ed. 2, 125). Along the Snowdon range in many places (W. Brand, in herb. Watson). In a small spring near the summit of Ben-na-Bourd, 1832 (herb. Watson).

76. *Saxifraga umbrosa*, L.—Found in Ireland only; and on nearly all the mountains of Kerry, from sea-level up to 1027 m. on Carn Tual (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578). "In Kerry, Connemara, and Waterford, the prevalent leaf-form is one with strongly serrate margins, and truly crenate forms are very rare in Ireland" ("Cyb. Hib." ed. 2, 128). Summit of Carn Tual (J. Carroll, 1853, in Herb. Brit.). First reported as an Irish plant by Rd. Heaton in 1650 (How, "Phytologia"). Accidentally omitted by Linnæus from first edition of *Sp. Plantarum*, as it is duly mentioned in *Hort. Upsaliensis*, p. 108, n. 2 (1748), under Magnol's name. The two alpine Saxifrages which follow may be noted here, but are not satisfactorily cleared up, and are possibly forms of *S. sponhemica*.

? 77. *Saxifraga platypetala*, Smith (1811).—Recorded from Snowdon (Dawson Turner, in herb. Smith, and Herb. Kew.). "Mr. Turner gathered this Saxifrage upon Snowdon in 1802, and communicated it to us long ago as a new species" (Smith, "Engl. Botany," t. 2276, 1 May 1811).

? 78. *Saxifraga latevirens*, D. Don (1822).—"In very elevated situations, upon moist rocks, on the mountains of Angusshire and Aberdeenshire" (G. Don, in Smith, "Engl. Flora," ii. 280).

79. *Chrysosplenium oppositifolium*, L.—Ascends to 1037 m. on the mountains of the Breadalbane district, on damp and shady rocks ("Fl. Perthsh." 144). "Grows very near the perennial snow" (Watson, "Outlines Geograph. Distrib. Brit. Pl." 1832, p. 157). There is, however, no "perennial snow" on the Perthshire mountains.

Fam. 23. CRASSULACEÆ.

80. *Sedum roseum*, Scop.—Common on damp alpine rocks in the Breadalbane district, ascending to 1175 m. on Ben Lawers ("Fl. Perthsh." 146). Ben Lawers, near the summit (T. A. Sprague, 1895). Descends to sea-level in Galway.

81. *Sedum villosum*, L.—Widely distributed in marshy places on the mountains of the Breadalbane district, ascending to 1100 m.

as on Ben Lawers ("Fl. Perthsh." 146). Ben Lawers, 1807 (Herb. Kew.).

Fam. 24. UMBELLACEÆ.

82. *Heracleum sphondylium*, L.—Ascends to 1006 m. in the Breadalbane district ("Fl. Perthsh." 161). Descends to sea-level in Cork.

Fam. 25. CARYOPHYLLACEÆ.

83. *Melandryum diurnum*, Fries (1842).—On the cliffs of Cairn Gorm, at 1000 m. (G. C. Druce in "Journ. Bot." 1889, 202). Ascends to 1067 m. on Loch-na-gar (F. B. White in "Scot. Nat." i. 119 [1871]). Descends to sea-level on Lambay island, off the coast of Dublin (H. C. Hart, 1883).

Syn.—*Lychnis dioica*, L., Sp. Plant. 437 (1753), excl. varr. β et γ ; *Lychnis dioica*, var. *rubra*, Weigel, "Fl. Pomerano-Rugica," 85 (1769); *Lychnis silvestris*, Schkuhr, "Handb." i. 403, t. 124 (1791); *Saponaria dioica*, Moench, Meth. Plant. 76 (1794); *Lychnis diurna*, Sibth. "Fl. Oxon." 145 (1794); *Saponaria diurna*, Fenzl, in Endl., "Gen. Plant." 974 (1840). To associate the Linnean specific name (of the aggregate) with *Melandryum* would unnecessarily make a new combination, and increase the synonymy.

84. *Silene acaulis*, L.—First recorded as a British plant in 1641, under the name of "Caryophyllus montanus minimus sive Caryophyllus pumilio alpinus" (Johnson, "Merc. Bot." ii. 18). The earliest locality given is "on the steep and higher rocks of Snowdon Hill in Carnarvonshire" (Ray, "Syn. Meth. Stirp. Brit." 141 [1690]); and found almost everywhere on Snowdon by Edward Lloyd (in Gibson's edition of Camden's "Britannia," 1695). Snowdon (J. Turner, 1806, in Herb. Kew.). On the upper ledges of Snowdon everywhere (Banks, 1773, in Herb. Brit.); summit of Snowdon (herb. Mrs. Robinson, in Herb. Brit.—before 1847). Carnedd Dafydd, Carnedd Llewelyn, and Snowdon (J. E. Griffith, "Flora" [1895]). On the summits of the loftiest mountains in Scotland (Smith, "English Fl." ii. 299). On all the elevated mountains of Scotland (Hooker, "Fl. Scotica," 135). "The flowers have no scent, but they constitute one of the most charming ornaments of the green-headed Scottish Alps" (Smith). Ascends to the summits of Ben Lawers ("Fl. Perthsh." 77), Ben Alder (White), Ben Macdhui (Watson, 1832), and Ben-na-Bourd (Watson, 1844). Abundant on Ben Dearg, in Ross-shire (with both white and red flowers), also on several other hills in the neighbourhood, up to 1006 m. (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, 228). The drawing for "Engl. Botany," t. 1081, was from a Snowdon specimen supplied by Dawson Turner in 1802.

85. *Alsine sedoides*, Kittel, "Taschenb. Fl. Deutschl." ed. 2, 997 (1844).—Ascends to the summit of Ben Lawers, on bare

ground and rocks ("Fl. Perthsh." 84). Near the summit of Ben Lawers (Wm. Gardiner, 1842, in Herb. Brit.). Abundant on the ridges of Ben Dearg (in Ross-shire), and on two other hills in the district, up to 1100 m. (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, p. 228). Syn.—*Cherleria sedoides*, L., "Sp. Plant." 425 (1753); *Mähringia sedoides*, Clairv., "Man. Herb." 150 (1811); *A. Cherleria*, Petermann, "Deutschl. Fl." 85 (1846-1849); *A. Cherleriana*, Saint-Lager, in "Ann. Soc. Bot. Lyon," vii. 144 (1880).

86. *Alsine rubella*, Wahlenb.—"I found the plant upon Ben Lawers in Breadalbane, and I never observed it anywhere else. I believe it to be new to Britain. I first found it in 1793 in company with Mr. John Mackay" (G. Don, *mss.* in Herb. Mus. Brit.). This label is attached to specimens in Sowerby's herbarium, used for the figure in "Engl. Botany Suppl." t. 2638; where after the description D. Don writes, "Found by the late Mr. J. Mackay and Mr. G. Don, many years ago on the summit of Ben Lawers." To these specimens G. Don gives the provisional name of *Arenaria alpina*. *Alsine rubella* first appears as a British plant in Smith, "English Fl." ii. 309 (1828). Rocks on the summit and above the loch of Ben Lawers (G. Don, J. Mackay, 1794, and Wm. Gorrie, 1840, in Herb. Brit.). The south limit of the plant in Europe is on the summit of Craig-na-Caillich, above Loch Tay, Perthshire, at 912 m. (R. K. Greville, 1824, in Herb. Bot. Gard. Edinb.). A more recent record is "on rocks near the summit of Ben Lawers" (R. Lindsay in "Trans. Proc. Bot. Soc., Edinb." xxi. 104 [1898]). Fenzl, in Ledebour, "Fl. Rossica," i. 347-350 (1842), has included under *Arenaria verna*, L., a great many forms and species distinguished by different authors. The large-flowered typical form of *A. verna*, such as is found in the Swiss and Italian Alps, is not found in arctic regions, but there are in the Alps other forms which connect it with the arctic forms. Among such arctic forms it is not possible to group the plants and separate them by definite characters. In the driest stations the plant appears as var. *rubella*, generally even smaller and with shorter peduncles, as the figure of Wahlenberg shows. In somewhat moister and looser soil, it gets longer internodes, more leafy branches and longer flower-stalks, which are often 2- to 3-flowered, that is to say, it goes over to var. *hirta* Gürke (= *Alsine hirta*, Hartman [1838]). The above critical note is taken mainly from Mr. H. G. Simmons' interesting remarks on the species in his "Fl. of Ellesmere Land" (1906).

87. *Sagina procumbens*, L.—Ascends to 1006 m. on bare ground on the mountains of the Breadalbane district ("Fl. Perthsh." 86), such as Ben Ein (E. S. Marshall, 1889, in Herb. Brit.). Descends to sea-level in Cork.

88. *Sagina stricta*, Fries, "Novit. Fl. Suecic." i. 74 (1814-1823).—This I believe to be the species to which should be referred the plant mentioned in Mr. F. N. Garry's "Notes" in "Journ. Bot." 1903, suppl. p. 36, in regard to the specimen in herb. Sowerby, probably used for the figure of *Sagina maritima* in "Engl. Botany," t. 2195 (issued September 1, 1810): wherein it is stated, "Mr. G. Don sent the same from the summit of Ben Nevis in 1803." This interesting specimen has Don's label attached, and is here transcribed with the original spelling in the characteristic orthography of this remarkable botanist:—"S. alpina, this I believe to be a new species. I found it upon ben Nivis in Lochaber, this answers to the following description: foliis radicalibus linearibus, obtusis nitidis flore apetalis; this differs from the *apetala* in the radical leaves being broader and obtuse and [?] opening, and it is a considerable larger plant. I have cultivated this and *apetala* both for 2 years, and they remain permanently different. This is a cultivated specimen, but it is in no way different from the wild spe. in appaarence; found in 1794." In support of this identification, Messrs. Groves (in Bab. "Man." ed. 9, p. 58) write that "Fries states that his plant sometimes occurs upon mountains in Norway; and G. Don seems to have found it on Ben Nevis." The plant from Cairn Gorm, referred to *Sagina alpina* by Mr. G. C. Druce (in "Ann. Scot. Nat. Hist." 1892, p. 273), has a central rosette, short peduncles, and sepals equalling the petals, and seems to me to be much nearer the type of *S. maritima*, G. Don, "Herb. Brit." fasc. vii. n. 155 (1806), than to the same botanist's *Sagina alpina*, found by him on Ben Nevis. Mr. G. C. Druce made an ascent of Ben Nevis for the express purpose of finding Don's plant, but the weather being unfavourable, with cold and driving rain, the search unfortunately did not prove successful—that is supposing it to be still in existence there. We have then but David Don's statement that his father found it still there in 1803, nine years after he first discovered it on the mountain. In English floras *S. stricta* is given as a synonym of *Sagina maritima*; but the former, like Don's plant from Ben Nevis, is distinguished by the following characters:—peduncles straight, not ascending, less shining, flowers apetalous (Mr. Druce's *Sagina alpina* from Cairn Gorm has conspicuous petals), sepals lanceolate subacute, not oval obtuse, leaves sub-cylindrical (not lanceolate-linear) and quite obtuse, with shorter internodes, stem usually solitary and without a central sterile rosette, simple at the base and slightly dichotomously branched above, always firm and strict from being more stoutish with closer leaves. The specimen, dated 1803, is in herb. Smith, and agrees exactly with that dated 1794 in Herb. Mus. Brit.

Syn. *S. maritima*, var. *alpina*, Syme, "Engl. Botany," ii. (1865); *S. maritima*, var. *stricta*, Clavaud, in "Act. Soc. Linn.

Bordeaux," xxxv. 386 (1881); *S. stricta*, var. *a alpina*, Fries, "Novit. Fl. Suecic." ed. 2, 58 (1828).

Its continental distribution includes Sweden, Norway, Finland, France, and N. Italy.

89. *Sagina Linnæi*, Presl.—Ascends to the summit of Ben Lawers ("Fl. Perthsh." 86). "At great heights even near the summit of Ben Lawers" (R. Brown, 1794, in Herb. Brit.). Smith ("Fl. Britannica," ii. 504 [1800]) says, "Mr. J. Mackay gathered it on Ben Lawers in 1794." Hooker, however ("Fl. Scotica," 145 [1821]), thinks it was first found by G. Don previously on Meall Ghaordie. Some other plants gathered here by G. Don are dated 1793. Ben Lawers, a series of examples gradually passing from the erect hardy rooting form of the summit into the ordinary procumbent more or less rooting form which descends to 762 m. (E. S. Marshall, 1887, in Herb. Brit.). Between 945-1022 m. on Ben Lawers (Prof. Balfour, 1864, in Herb. Brit.). Ascends to 1070 m. on Ben Ein (W. R. Brunton, 1864, E. S. Marshall, 1887, in Herb. Brit.). Corrie near summit of Stob-Coire-an-Easain-Mhor, above Loch Triag, 1891, Herb. Brit. ex herb. J. H. Morgan). Ben Lawers (J. Mackay, 1794, in Herb. Kew.); Meall Ghaordie (Herb. Kew. ex herb. Dawson Turner, dated 1789), "This is the earliest British specimen of the plant I have seen, and is very probably one gathered by G. Don, referred to above, as it is among Hooker's Scottish plants. Ascends to 1006 m. on the Grampians of Aberdeenshire" (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, p. 168).

(To be continued.)

ZOOLOGICAL NOTES.

Pygmy Shrew 2000 Feet above Sea-level.—In November a Shrew was sent to me, which had been found crossing a snow-patch at an altitude of at least 2000 feet, by Mr. Ferguson, head stalker of Coiynafearn deer forest. It was subsequently identified at the Royal Scottish Museum as a specimen of the Pygmy or Lesser Shrew—*S. minutus*. It will be remembered that one of these little animals has been recorded from the summit of Ben Nevis.—CHAS. H. ALSTON, Letterawe, Loch Awe.

The Occurrence of *Phylloscopus borealis*, not *P. viridanus*, at Sule Skerry: a Correction.—In the "Annals" for 1903, p. 22, I recorded the occurrence of the Greenish Willow Warbler (*P. viridanus*) at the Sule Skerry lantern on 5th September 1902; and on 22nd October 1902, the late Mr. Howard Saunders exhibited this specimen at the British Ornithologist's Club, and confirmed my iden-

tification (cf. "Bull. Brit. Orn. Club," xiii. 12). Having had occasion to re-examine this specimen, I was convinced that a mistake had been made, and that the bird was a specimen of Eversmann's Warbler (*P. borealis*)—a conclusion with which Dr. Hartert entirely agrees. Mr. Saunders and myself were both mistaken, being misled by the fact that the bird had only a single wing-bar. This conspicuous character is, however, shared by a considerable number of specimens of *P. borealis*, though the fact is not stated in any of the works on palæarctic birds to which I have access, and in most of them much importance is made of the double wing-bar which is more or less in evidence in the majority of examples of that species.

One now wonders if the specimen of *P. viridanus* obtained in North Lincolnshire by Mr. Caton Haigh, in the autumn of 1905, and also exhibited at the Ornithologist's Club, was really of that species and not *P. borealis*: the latter bird, from its being a summer visitor to northern Europe, is much the more likely to occur than its more eastern congener.—WM. EAGLE CLARKE.

Long-eared Owls near Lerwick, Shetland.—On the 25th of February 1909 I was out at Hayfield, near here, and saw three Long-eared Owls among the trees. For the last fortnight of February we had a spell of marvellous weather, more like summer than early spring. Probably this may have been an inducement for them to visit us. Two of the birds had been seen by the Hayfield household for a couple of weeks before, but the third was only seen for the first time on the 25th February. I do not remember hearing of them at this season before. I saw quite a lot of Blackbirds at Hayfield too.—JOHN S. TULLOCH, Lerwick.

Nesting of the Stock-Dove in Lanarkshire.—In the Blantyre district of Clyde valley the Stock-Dove (*Columba oenas*) is now becoming quite established as a breeding species. In the autumn of 1906 I was informed by an acquaintance who pays some attention to bird-life, that he felt sure the Rock-Dove was breeding, as he had seen one in the summer flying out from a rocky bank. Having an idea that he meant the Stock-Dove, I determined to find out in the following summer; and was successful in finding two nests in the beginning of May. In one of these two young ones were successfully reared; but the other pair of eggs were, I think, destroyed by Magpies, which are far too plentiful here.

Last season I located four pairs breeding here, but only the small total of three young were fledged. The nesting sites chosen were all pretty similar—a shelving part in the rocky bank; and in no case was there much attempt at nest-building.—WALTER STEWART, Blantyre, Lanarkshire.

Whooper in Fifeshire.—On 18th January I picked up a dead Wild Swan (*Cygnus musicus*) at the edge of Morton Loch, near Tayport. I had no hand in compassing its death, but it may very

possibly have been shot at about the Tay Estuary, and have flown inshore to this Loch after being wounded. It was recently dead when found.—WILLIAM BERRY Tayfield, Newport, Fife.

Gadwalls in Fifeshire.—Since I wrote my note on this species for the January number of the "Annals," I have two more occurrences of the Gadwall (*Anas strepera*) to record for this district. On 25th January a pair were seen at "flight time" on the Morton Loch, near Tayport, on the Tay Estuary, one of which, a drake, was secured and sent to the Royal Scottish Museum. On the 29th a flock of between 29 and 30 appeared at the same loch, three of which, as it happened, fell to one shot. From this I think it may be assumed that the whole flock was made up of Gadwalls, but it was too dark at the time to allow of species being otherwise identified with any certainty. Of the birds secured, two, a drake and a duck, were in full adult plumage, and these were also sent to the National Museum.—WILLIAM BERRY, Tayfield, Newport, Fife.

The Occurrence of the Gadwall in Orkney.—The occurrence of the Gadwall (*Anas strepera*) in Orkney may be of interest, as the species is described as being only an occasional visitant to the islands. On 8th March 1904 I got an adult drake on Loch Stenness, knocked out of a large pack of Wigeon. Two days afterwards I saw a female sitting on the loch about 150 yards from the shore. The second occurrence was on 14th December 1906, when I saw an adult male paired with a female Wigeon. I could have shot him two or three times as he passed close to me in his endeavours to get the Wigeon away, which he eventually did in safety for the time being; but about half an hour later I again saw them fly into this particular bay, and with a long high shot dropped the female bird, which I naturally thought was a female Gadwall. There is no doubt as to his being a Gadwall, as he twice passed well within shot on our first meeting, showing all his beautiful markings distinctly.—H. W. ROBINSON, Lancaster.

Heronries in Forth.—The list of "Forth" Heronries given in Mr. Boyd Watt's paper in the "Annals" for October last needs a good deal of "starring" and other explanation. According to my information there are now only four Heronries in the Forth area, namely, Tyninghame (not, however, Binning Wood, which was abandoned some fifty years ago), about 20 pairs (I remember when there were twice that number); Donibristle, about 10 pairs; Blair-Drummond, 4 or 5 pairs; and Brucefield, adjoining Tulliallan, 15 to 20 pairs. The other localities mentioned have either been entirely or practically abandoned, or never could boast of more than one or perhaps two nests now and again. The Dalkeith heronry ceased to exist over forty years ago.—WILLIAM EVANS, Edinburgh, December 1908.

Parasitic Habits of the Black-headed Gull.—In the recent notes in the "Annals" on the 'Food of the Black-headed Gull,' mention has been made of this species robbing Lapwings only, but I have lately noticed that it does not confine its attention to this bird. Near Loanhead, on 15th December last, I distinctly saw these Gulls robbing Golden Plover of the worms they were catching; while near Portobello, on 14th February, two Starlings were being victimised. In each case Lapwings were also feeding in the field and were being freely robbed. It, therefore, almost appears that this habit having originated with the Lapwing as victim, is being extended to any species feeding alongside, provided it is capturing suitable food and is not powerful enough to withstand the Gull. Following this supposition I have closely watched members of the Thrush family, Redwings in particular, when feeding beside Lapwings and Gulls, but so far I have noticed nothing in their case. Some Curlews, too, which I saw freely catching worms in a field near Annan, on 14th January, were left unmolested, while the Lapwings beside them were being subjected to a most rigorous persecution by these Gulls. This record, with regard to the Lapwings, may be of some interest on account of the locality. It will be interesting to hear if others have noticed birds other than the Lapwing being victimised by Gulls.—G. G. BLACKWOOD, Edinburgh.

The Black-headed Gull as a Persecutor of the Lapwing.—Mr. Laidlaw and Mr. Evans have drawn attention in the "Annals" to the curious lack of records in British bird-books on this remarkable habit. In Mr. Ussher's "Birds of Ireland," p. 332, however, there is the following reference in the account of the Black-headed Gull:—"In severe frost, when Lapwings are driven to the southern pastures, each of these birds may sometimes be seen shadowed by a Black-headed Gull, and the moment the Plover pulls out a worm the attendant Gull rushes forward to seize it; the Lapwing takes flight and doubles like a hare, closely pursued by its tormentor. Possibly the name of Lapwing-Gull may be given in consequence of this habit." It may be worth noting that the habit is of daily occurrence in the Lothians nowadays (during winter), quite irrespective of severe weather.—S. E. BROCK, Kirkliston.

Black-throated Diver in Fifeshire.—On 21st January a young Black-throated Diver (*Colymbus arcticus*) was killed at a Loch on Morton, near Tayport, Fifeshire. It was feeding vigorously on trout at the time it was killed, and in fact four trouts, each about 10 inches long, were shaken out of its gullet when it was brought ashore. It is impossible to leave such voracious birds to feed unmolested on what is in fact an artificial fishing loch, and its destruction, otherwise regrettable, was therefore a matter of necessity. As it turned out, however, the Royal Scottish Museum

did not possess a specimen of this Diver in the particular stage of plumage of the bird in question ; and it has therefore been accorded an honourable resting-place in the National Collection.—WILLIAM BERRY, Tayfield, Newport, Fife.

Fork-tailed Petrels in Orkney.—On the night of 21st September 1908, the third night of fog, specimens of the Fork-tailed or Leach's Petrel (*Procellaria leucorrhoa*) came to the lantern of the Sule-Skerry Lighthouse, Orkney, and three were captured to send to me by the light-keeper. The Storm Petrel (*Procellaria pelagica*) nests on this island in large numbers, but the Fork-tailed is very rare there. Writing a week previous to their visit, the light-keeper informed me that during his six years' service on the island only three of the Fork-tailed species had been seen there.—H. W. ROBINSON, Lancaster.

Bass in the North Sea in Winter.—Mr. Thomas Cook, fishmonger, Edinburgh, has presented to the Royal Scottish Museum a fine specimen of the Bass (*Labrax labrax*), 23 inches in length and weighing 3 lbs. 5¼ ozs., which was captured 20 miles east of May Island on 14th January. This fish is only occasionally captured in Scottish seas, and is rarely taken anywhere in British waters during the winter months.—W. EAGLE CLARKE.

Ray's Sea-Bream in the Firth of Forth.—On the 10th of January a fisherman brought me a fine specimen of this fish which he had picked up on the beach at North Berwick. It was in perfectly fresh condition, and measured 22 inches by 9 inches.—W. M. INGLES, North Berwick.

[Although Dr. Parnell in his "Fishes of the Firth of Forth," published in 1838, regarded *Brama raii* as a somewhat frequent visitor, yet little information regarding this fish has been placed on record since his day. All we know is that several were cast ashore in the Firth in the winter of 1850 ; and, now, we have Mr. Ingles' interesting record.—EDS.]

Note on the Re-discovery of *Apus cancriformis* in Britain.—The Editor has requested me to send him an account of my discovery of *Apus cancriformis* in Kirkcudbrightshire in September 1907. There is very little to say about it, but there are one or two facts not mentioned by Mr. Robert Gurney in his short note in "Nature," 10th October 1907, which it may be well to put on record.

I was "fishing" the small pools on Preston Merse, Southwick, for Water-beetles, and having worked my net through a grassy shallow one, I emptied the contents on to my mackintosh sheet, and saw a thick mass of wriggling *Apus*. The pool was perhaps 6 inches deep, grassy almost all through it, and the water was somewhat fouled by cow dung. There were several hundred individuals.

in the first haul, and on looking again at the pool I saw that the water was moving with them. Another similar pond close by was found to be in the same condition.

Both ponds had been much deeper, and were then drying up, which probably accounts for the "density" of the fauna!

On my return to the spot some ten days later, the pools were both dry and hard, and all over the mud were marks of Sea Gulls' feet, the only sign of *Apus* being a number of "shells" on the mud! On that occasion I found one other pool, rather deeper than the other two, which contained some *Apus*, and I took the precaution of distributing them in two or three other pools round about, which looked as if they were permanent. All these pools are so situated that they are *very* occasionally submerged by the sea, as I learnt from some of the local inhabitants.

I examined the same ground in July of last year and found all the pools dry, even those which I had thought were permanent. I returned there again in September, and although all the pools were then full of water, there was no sign of *Apus*.

The appearance of the species in Britain has been spasmodic, it having been recorded, I believe, only some three or four times, so that it can scarcely be called a native species, unless there is some permanent and as yet undiscovered centre in Britain, which seems most improbable. The species is common in Central Europe, and it is certainly remarkable that it should suddenly appear in the south-west corner of Scotland. Dr. Scharff when he heard of my discovery suggested that possibly I had found *Lepidurus glacialis*, an arctic-alpine phyllopod common in Northern Scandinavia, Greenland, etc., and of which fossil remains have been found in the northern parts of the British Islands. There seems no doubt, however, that the Preston Merse species is *Apus cancriformis*.—FRANK BALFOUR-BROWNE, Holywood, Co. Down, Ireland.

Notes on Lepidoptera in the N.E. Highlands.—I. The following is a further list of species unrecorded for Ross-shire in Barrett's "British Lepidoptera" which I have taken, mostly in 1908, at or in the neighbourhood of Swordale.

Leucania lithargyria, Esp.; *Luperina testacea*, Hb.; *Agrotis saucia*, Hb.; *A. præcox*, L.; *A. simulans*, Fb.; *Noctua depuncta*, L.; *Anchocelis litura*, L.; *Xanthia flavago*, Fb.; *Dasyptolia templi*, Thnb.; *Epunda lutulenta*, Bork.; *Aplecta tinctoria*, Brahm.; *Hadena thalassina*, Rott.; *Tephrosia punctularia*, Hb.; *Geometra papilionaria*, L.; *Panagra petrarum*, L.; *Hibernia aurantiaria*, Esp.; *Larentia olivata*, Bork.; *Eupithecia trisignaria*, H.-S.; *E. tenuiata*, Hb.; *Herbula cespitalis*, Schiff.; *Ennychea octomaculata*, Fb.; *Scopula alpinalis*, Schiff.; *Alucita hexadactyla*, L.; *Phycis fusca*, Haw.; *Leptogramma niveana*, Fb.; *Peronea rufana*, Schiff.; *P. sponsana*, Fb.; *Penthina marginana*, Haw.; *Sericoris urticae*, Hb.; *Euchromia*

mygindana, Schiff.; *E. arbutella*, L.; *Sciaphila virgaurena*, Tr.; *Phoxopteryx inornatana*, H.-S.; *P. lundana*, Fb.; *Grapholitha subocellana*, Don; *G. trimaculana*, Don; *G. naevana*, Hb.; *G. geminana*, St.; *Hypermercia angustana*, Hb.; *Paedisca corticana*, Hb.; *Ephippiphora similana*, Hb.; *Coccyx argyrana*, Hb.; *C. vacciniana*, *Pamplusia mercuriana*, Hb.; *Stigmonota perlepidana*, Haw.; *S. internana*, Gn.; *Dicrorampha herbosana*, Bar.; *Catoptria cana*, Haw.; *Trycheris aurana*, Fb.; *Simæthis pariana*, L.

II. The following Tineæ have not been recorded so far north in Meyrick's "Handbook of British Lepidoptera":—*Diurnea fagella*, Sta.; *Semioscopus avellanella*, Hb.; *Tinea semifulvella*, Haw.; *Cerostoma vittella*, L.; *C. parenthesesella*, L.; *Phibalocera quercana*, Fb.; *Depressaria ocellana*, F.; *D. ciliella*, Stt.; *D. heracliana*, De Geer; *Gelechia nigra*, Haw.; *Chelaria hubnerella*, Don; *Chauliodus chærophyllellus*, Göze; *Lithocolletis junoniella*, Z.; *Bucculatrix nigrocomella*, Z.; *Gracilaria alchimiella*, Scop.

III. The following species unrecorded for so far north were taken in the neighbourhood of Stirkoke, Wick, in the beginning of September 1908:—*Notodonta dromedarius*, L.; *Thyatira batis*, L.; *Cymatophora*, Fb.; *Asphaia flavicornis*, L.; *Demas coryli*, L.; *Tapinostola fulva*, Hb.; *Triphæna janthina*, Esp.; *Xanthia flavago*, Fb.; *Selenia bilunaria*, Esp.; *Hypsipetes ruberata*, Frr.; *Botys lutealis*, Hb.; *Peronea sponsana*, Fb.; *Paedisca ophthalmicana*, Hb.; *Halonota similana*, Hb.

It may be worth mentioning that 36 specimens of *Dasyptolia templi*, Thnb., were taken at light in Caithness between the middle of September and 22nd of October, forming the greatest proportion of moths taken at that time, even *Plusia gamma*, L., being far inferior in numbers. *Epunda nigra* was also taken.—DOROTHY JACKSON, Swordale, Ross-shire.

Hystriehopsylla talpæ, Curt., in Forth and Tweed. — In my notes on 'Siphonaptera' in the "Annals" for 1904 and 1906, I recorded this large flea from Moles' nests in several places in Midlothian, Fife, and Peeblesshire. Since then I have found it commonly in nests of the same animal in other localities in these counties, and also in East Lothian and Linlithgowshire. During the twelve months from February 1908 to February 1909, I examined 100 moles' nests in the above five counties, and found *Hystriehopsylla* present in about three out of every four, the number in a nest ranging from two up to six or seven. The nests were examined in January, February, March, April, May, and November, and the flea was observed in each of these months, to which may be added August, for which I have already recorded it; so that it probably occurs throughout the year. Larvæ were also found on a number of occasions and were specially noted on 6th February last near Bathgate. The small yellow flea *Typhlopsylla gracilis* was also

present in most nests in all of the five counties.—WILLIAM EVANS, Edinburgh.

Paniscus Michaeli, *Koen*, in Selkirkshire.—This was first found by Michael at Davos am Platz. It has since been recorded for Ireland by Halbert, and has also been chronicled by Evans as occurring in the neighbourhood of Edinburgh. Last September I found specimens at the Loch of the Lowes, near the point where it is fed by the stream named on the maps as Little Yarrow, but known locally by another name. I also got one specimen of a nymph.—WM. WILLIAMSON.

BOTANICAL NOTES AND NEWS.

The High Alpine Flora of Britain.—I have observed *Saussurea alpina* at less than 300 feet on the hills south of Durness, W. Sutherland; and a very luxuriant, broad-leaved form from rocks on the sea-shore near Thurso, Caithness, was annotated by its collector, Mr. F. Crawford: "These plants must have been splashed by the salt water." *Cochlearia grœnlandica* is a strictly subarctic species; the alpine plants formerly referred to it are, as is noted in "Journ. Bot.," 1894, p. 290, my *C. micacea*. I have cultivated *C. micacea* for more than twenty years; it is very constant, comes true from seed, and is, in my opinion, quite distinct from *C. alpina*, Wats., which retains its character equally well. I do not now think that we have *C. arctica*, Schlecht., in Britain; but there are some unnamed Scottish coast plants in my herbarium which do not seem to agree well with any known form—especially one from the shore of Loch Linnhe, near Fort William. *Saxifraga quinquefida* from Ben Lawers is, I believe, the common Highland mountain plant now usually assigned to *S. sponhemica*, and formerly called *S. platy-petala*. *S. grœnlandica* (at least, the Brandon Mountain, Kerry, form; I have not seen it from Ben Lawers) comes very near indeed to *S. cœspitosa*, the chief difference being in the narrower and more acute foliage. It may be added that Dr. Williams's *Hieracium alpinum* is *H. holosericeum*, Backh., and that his Hawkweed names frequently differ from those adopted by Rev. W. R. Linton in the "British Hieracia" (1905).—EDWARD S. MARSHALL, West Monkton Rectory, Taunton.

Montia lamprosperma, *Cham.*, in Scotland.—My attention being called by my friend Wm. Ostenfeld to the occurrence of our plant in the Faroes, I was led to examine my Scottish specimens. I was glad to find it represented in my herbarium by specimens I gathered in Glen Dochart, Perth, in 1874; by others from Dornie and Glen Docharty, West Ross, in 1881; from the Spout of Loch-na-Gar at

3400 feet in S. Aberdeen, in 1892; near Dalmally, Argyll; Lerwick (R. Tate in Hb. Brit. Mus., 1865); Aviemore, Easternness, in 1882; and Broughton in Peebles in 1888. It has been collected in St. Kilda, in 1905, by Mr. O. Paulson. It may be known from *fontana* by its larger seeds being chestnut-brown, shining, and reticulate. In *M. fontana* (*M. chondrosperma*, Fenzl) the seeds are smaller, dull, dead-black, covered with acute tubercles. Each species has its water-form. In Kirkdale Pass, Cumberland, I have found it as a small upright plant, but the seeds are quite typical. On the contrary a floating form which is named *M. rivularis*, from Jersey, in Hb. Brit. Mus., is only *M. fontana*. The last edition of Koch's "Flora Germanica" keeps them as distinct species. The larger of *lamprosperma* is distinctly northern, being the only form found in the Faroes, Iceland, Greenland, and the common one in Denmark; occurring also in North Germany, Scandinavia, Russia, Finland, etc. It is also recorded for France, etc. I have found it also in North Ireland, and on Glydyr Fawr in North Wales.—G. CLARIDGE DRUCE, M.A.

Solidago *sp.*—On one bank of the Forth between Stirling and Gargannoch, Mr. H. N. Dixon, the eminent bryologist, saw a species of *Solidago* quite naturalised. Can any reader obtain specimens so that the species may be identified?—J. CLARIDGE DRUCE, Yardley Lodge, Oxford.

Schœnus nigricans, *L.*, in Haddingtonshire.—To the few counties given for this Rush in Prof. Trail's "Topographical Botany of Forth and Tweed" (*l.c.*), should be added Haddington (82). It occurs very sparingly on the links between Aberlady and Gullane, where it was gathered by Mr. A. H. Evans during an excursion of the Berwickshire Naturalists' Club on 29th August, 1900, as recorded in the "Proceedings," xvii. 240. I was with the Club on that occasion and got a specimen of the *Schœnus* from Mr. Evans, but did not see it growing, and it was not till 29th August last that I succeeded in rediscovering it—a single tuft only.—WILLIAM EVANS, Edinburgh.

Goodyera repens, *R. Br.*, in Haddingtonshire.—According to Prof. Trail's 'Topographical Botany of the River-Basins Forth and Tweed,' published in "Transactions of the Botanical Society, Edinburgh," for 1903, *Goodyera repens* has not been recorded from county 82, *i.e.* Haddington. The plant, however, grows abundantly in several pine woods in the central portion of the county, where it has been known to myself and others for a number of years past. The westmost point to which I have traced it, is near Fountainhall, where a few patches were met with in May 1906. Unfortunately, through the cutting down of certain woods in the district where it chiefly occurs, the area occupied by the plant has

been greatly curtailed during the last few years. In 1904 I witnessed the total destruction of many acres of it in this way. To one interested in the preservation of our native Flora, it was a sad sight; and I carried away armfuls of the trampled and uprooted orchid, and planted them in the adjoining woods. A few plants were also brought home and put out (April 1904) in the big pine wood at Bavelaw, near Balerno, in Midlothian, but I have failed to see anything of them in subsequent years. According to a note in the "Transactions of the Edinburgh Field Naturalists' Society" (iii. 298), *Goodyera repens* was discovered near Balerno by Dr. W. Watson, on 29th July 1896; but the statement was evidently the result of some misunderstanding, for Dr. Watson informs me he never saw the plant about Balerno or anywhere else in the county. With reference to the record of *Goodyera repens* from near Stromness, Orkney, in their magazine for July last (p. 170), my wife reminds me that in July 1874 she sent me a specimen from Harray in the same district. Referring to the queries under *Listera cordata* in Prof. Trail's paper, I may say that I have gathered this species in two localities adjoining the Pentlands, in Midlothian; and also at Macbiehill, in Peeblesshire, together with the commoner *L. ovata*.—WILLIAM EVANS, Edinburgh.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—January-March 1909.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

THE BIRDS OF LENDALFOOT. Charles Berry, *The Glasgow Naturalist*, vol. i. pts. i. and ii. (Nov. 1908 and Feb. 1909), pp. 5-23.—A list of 162 species, all, with two exceptions, seen within a radius of four miles from Lendalfoot.

INCREASE OF WOOD-PIGEONS IN ORKNEY. James R. Hale, *British Birds*, March 1909, p. 345.—Noticed during 1907 and 1908 breeding in increasing numbers in the Island of Shapinsay.

NOTES ON THE EAGLES OF AYRSHIRE. John Paterson, *The Glasgow Naturalist*, vol. i. pts. i. and 2 (Nov. 1908 and Feb. 1909), pp. 28-32.—Mainly historical.

ICELAND FALCON IN SCOTLAND. Fred. Smalley, *British Birds*, February 1909, p. 310.—An adult example killed in December last on the Flannan Isles.

LITTLE RINGED PLOVER IN NORTH UIST. J. E. Harting, *The Field*, 20th February 1909, p. 329.—Specimen shot in October last by Mr. H. E. Beveridge.

LITTLE GULL IN ABERDEENSHIRE. A. Anderson, *The Field*, 16th January 1909, p. 118.—Specimen shot at Newburgh.

THE CHAR (SALVELINUS) OF GREAT BRITAIN. C. Tate Regan, M.A., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 111-122, and figs.—Four new species described from Scottish localities, and numerous notes given on distribution.

NOTES ON DIPTERA IN SCOTLAND. A. E. J. Carter, *Ent. Mo. Mag.*, March 1909, pp. 65-66.—A list of species taken at Comrie, Blairgowrie, Polton, Aberfoyle, etc.

DIPTERA IN DUMBARTONSHIRE IN 1908. J. R. Malloch, *Ent. Mo. Mag.*, February 1909, pp. 40-41.—Twenty-nine species recorded.

DASYNEURA (PERRISIA) STROBI, WINN., IN PERTHSHIRE. William Evans, *Ent. Mo. Mag.*, January 1909, p. 17.—Specimens obtained from cones of spruce at Callander.

SOME PHORIDÆ IN DUMBARTONSHIRE IN 1908, WITH DESCRIPTION OF A NEW SPECIES. J. R. Malloch, *Ent. Mo. Mag.*, February 1909, pp. 34-36.—*Phora (Aphiocheta) fumata*, n. sp.

ON THE BRITISH SPECIES OF PHORA (PART II.). John H. Wood, M.B., *Ent. Mo. Mag.*, March 1909, pp. 59-63.—*P. parva*, *mallochi*, and *glabrifrons*, nn. spp., are recorded from Scotland.

ORNITHOMYIA LAGOPODIS, SHARP, FROM A TAWNY OWL IN FIFESHIRE. William Evans, *Ent. Mo. Mag.*, March 1909, p. 65.

RETROSPECT OF A COLEOPTERIST FOR 1908. Prof. T. Hudson Beare, B.Sc., etc., *Ent. Record*, February 1909, pp. 25-30.—Numerous Scottish records are referred to.

A NEW METHOD OF COLLECTING COLEOPTERA. Norman H. Joy, M.R.C.S., F.E.S., *Ent. Mo. Mag.*, January 1909, pp. 1-3.—A large number of Scottish records are given in illustration of this paper.

NOTES ON VARIOUS BRITISH COLEOPTERA. E. A. Newbery, *Ent. Mo. Mag.*, February 1909, pp. 32-33.—*Melanotus rufipes* taken at Rannoch.

FURTHER NOTE ON THE SCOTTISH EXAMPLES OF NOTIOPHILUS STRIGIFRONS, BAUDI. G. C. Champion, *Ent. Mo. Mag.*, January 1909, p. 12.

A NEW COLEOPTERON—HOMALOTA SCOTICA, NOV. SP. E. G. Elliman, *Ent. Record*, February 1909, p. 33.—Described from

specimens obtained at Nethy Bridge in September last by Prof. T. Hudson Beare and Mr. H. St. John Donisthorpe.

BLEDIUS DENTICOLLIS, FAUR. : A BRITISH INSECT. H. F. Fryer, F.E.S., *Ent. Mo. Mag.*, January 1909, p. 6.—A specimen taken by J. C. F. Fryer at Nethy Bridge.

A COLEOPTERON NEW TO SCIENCE—ANASPIS HUDSONI, NOV. SPEC. H. St. J. K. Donisthorpe, F.Z.S., F.E.S., *Ent. Record*, March 1909, p. 60, pl. iii.—Described from a single male specimen taken at Nethy Bridge in September 1908.

TRICHOPTERYX INTERMEDIA, GILLM., VAR. THOMSONI, J. B. ERICSON, A BRITISH SPECIES. Horace Donisthorpe, F.Z.S., F.E.S., *Ent. Record*, March 1909, p. 58.—Taken in some numbers at Newtonmore, in June 1907; also at Nethy Bridge.

PHLÆOPHILUS EDWARDSI, STEPH., IN THE SOUTH OF SCOTLAND. William Evans, *Ent. Mo. Mag.*, January 1909, p. 15.—Records an example from Gifford, Haddingtonshire.

NOTE ON ORTHOPERUS MUNDUS, MATTH., FROM SCOTLAND. Richard S. Bagnall, *Ent. Mo. Mag.*, January 1909, p. 14.—A single specimen taken at Nethy Bridge in August 1908.

ARÆOCERUS FASCICULATUS, DE GEER, IN SCOTLAND. William Evans, *Ent. Mo. Mag.*, January 1909, p. 15.—Records a specimen captured in the Herbarium at the Royal Botanic Garden, Edinburgh.

MYRMECOPHILOUS NOTES FOR 1908. H. St. J. K. Donisthorpe, F.Z.S., F.E.S. (concluded), *Ent. Record*, January 1909, pp. 17-20, pl. ii.—The following records are given:—*Limosina* (?) *rufilabris*, Stnh., in nest of *Formica fusca* near Dumfries; *Thyreosthenius biovata*, Cambr., in nests of *Formica rufa* at Nethy Bridge; *Evansia merens*, Cambr., in nest of *Formica fusca* at Nethy Bridge.

ON SOME NEW AND RARE ENTOMOSTRACA FROM THE SCOTTISH SEAS. Thomas Scott, LL.D., F.L.S., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 122-130, pls. ii-iv.—Four new species and one new genus described.

NOTES ON LARVAL TREMATODES. William Nicoll, M.A., D.Sc., and William Small, M.A., *Ann. and Mag. Nat. Hist.*, March 1909, pp. 237-246.—The notes in this paper were made on material obtained in the Clyde area.

NOTES FROM THE GATTY MARINE LABORATORY, ST. ANDREWS—No. XXXI. Prof. M'Intosh, M.D., LL.D., F.R.S., etc., *Ann. and Mag. Nat. Hist.*, February 1909, pp. 153-180, pls. v. and vi.—Numerous notes are given on the distribution of the British Spionidæ.

BOOK NOTICES.

MY LIFE AMONG THE WILD BIRDS OF SPAIN. By Colonel Willoughby Verner (late Rifle Brigade). (London: John Bale, Sons, and Daniellson, 1909.) Price 21s. net.

Colonel Verner has long been known to ornithologists as one who has devoted the leisure half of an active life to the study of birds amid their native haunts, and to Spanish birds in particular. His handsome volume on the birds of Spain will prove a "treasure-trove" to all field ornithologists, for it does not often happen that a book based upon such ripe experience falls to their lot. The author devotes his opening chapters to the discussion of the paraphernalia and equipment of the would-be tree- or cliff-climber, and, after affording much practical information, gives interesting accounts of some of the almost overwhelming difficulties he has overcome, in which he shows very clearly that great skill, coupled with unflinching pluck, are necessary for work of this kind. He then proceeds to treat of the bird-life to be found in various haunts, commencing with a laguna with its Herons, Terns, Flamingos, Storks, Cranes, Bustards, and Stone Curlews. The Flamingos he alludes to as "flying close together and presenting the spectacle of a moving mass of crimson and rose and white streaming over the blue wavelets below." Another chapter describes a day in the cork woods among the small birds, such as Cetti's, Bonelli's, Orphean, and Rufous Warblers, Serin Finches, Orioles, Hoopoes, and Bee-eaters. Most of the book, however, is devoted to the Birds of Prey, for Spain is *par excellence* a country for their study. It is among the Raptores that we find Colonel Verner at his best, and he has much to tell us regarding the various species of Eagles, Kites, Vultures (the Lammergeir in particular), that is of extreme interest. The illustrations are numerous, and are either from drawings in water-colour by the author or from photographs taken by himself. Being entirely a record of personal experiences, and replete with original observations, the book is a valuable contribution to the literature of field ornithology, and is a most excellent and entertaining work throughout.

G. G.-M.

THROUGH SOUTHERN MEXICO, BEING AN ACCOUNT OF THE TRAVELS OF A NATURALIST. By Hans Gadow, M.A., Ph.D., F.R.S. (London: Witherby and Co., 1908.) Price 18s. net.

It is quite exceptional to have a work of this description from the pen of a trained zoologist of Dr. Gadow's standing, and the stay-at-home naturalist is placed under a debt of gratitude to the author for a singularly instructive and entertaining book. The author tells us in his preface that Southern Mexico "swarms with life," and yet how little has been offered us concerning its animals

and plants except in the monographic works of specialists. The description of the floating-garden of Xochimilico makes one think of a veritable paradise where "the authentic airs of Paradise do blow": here the famous Axolotls are denizens of its waters, and Dr. Gadow's remarks upon these paradoxical creatures and their development are most interesting. That the vegetation in Mexico is luxuriant, and that there is an enormous variety and abundance of fruit, one would naturally expect, but when we read of a forest where Salvias, Dahlias, Begonias, Geraniums, Oxalises, Fuschias, Tradescantias, Irises, and Thistles flourish, one cannot help longing to visit such a favoured spot. *Apropos* of this particular forest, however, we learn that animal life seemed almost absent, even birds were very scarce, but the presence of Armadillos proved an interesting find. The ornithologist will read with pleasure of Hang-Nests, Humming Birds, Macaws, Motmots, and various other feathered inhabitants of the Mexican forests; while the entomologist will find much that is worth reading about the Butterflies and Moths, and of the ways of the Leaf-cutting Ants and of Termites. Much information is given about Rattlesnakes and other reptiles; and of the *modus operandi* of the Vampire Bat. Dr. Gadow has also a great deal of knowledge to impart about the natives and their customs, whilst his descriptions of the scenery help us to realise the glories of the country about which he tells us so much and in so pleasant a fashion. The book is abundantly illustrated by excellent reproductions of photographs, and is well got up. G. G.-M.

REPORT ON THE IMMIGRATION OF SUMMER RESIDENTS IN THE SPRING OF 1907, ETC. By the Committee of the British Ornithologists' Club. (London: Witherby and Co., 1908.) Price 6s. net.

Like the Report for previous years noticed in the "Annals," the one for 1907 affords much information of a reliable nature on the arrival or first detection of summer birds in England. It also gives some notes on the spring and autumn (1906) movements of a number of other migratory species which have been reported to the Committee. The Report will be useful to those of our readers who are interested in the movements of migratory birds in Scotland, since it contains valuable data for instituting a comparison between the arrival, and other movements, of identical species in various localities from the shores of the English Channel northwards. The Committee are to be congratulated on the success that has attended its efforts.

TWO BOOKS ON EUROPEAN BIRDS' EGGS.

Since our last notice several instalments of Mr. DRESSER'S great work have appeared, carrying the parts down to xvi., and leaving only the Waders, Gulls, Petrels, and Divers, to complete the book. The plates which, it is almost needless to remind our

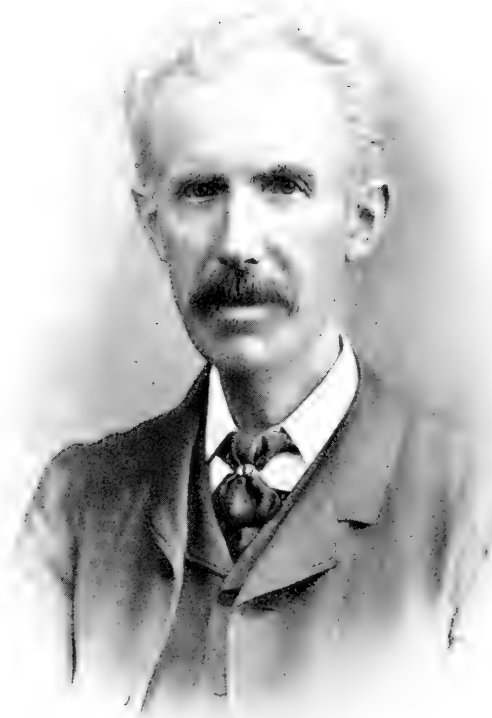
readers, are taken direct from the eggs themselves by the three-colour process, are marvellously good, and the author is much to be congratulated on the success that he has achieved, and on the marked progress he has made towards the completion of this most important work.

We welcome the appearance of part iii. of the Rev. Mr. JOURDAIN'S book on the same subject. The great merit of this work lies in the excellence and comprehensive nature of its text, upon which, it is manifest, great care has been bestowed. This work may be regarded as a companion to Dr. Hartert's "*Vögel der paläarktischen Fauna*," since it treats of all the subspecies recognised by that author as inhabiting Europe, and thus it occupies a place entirely its own among the egg-books in the English language. The figures of the eggs are, on the whole, very satisfactory.

THE MOTHS OF THE BRITISH ISLES. Second Series. By Richard South, F.G.S. (London: F. Warne and Company, 1908.) Price 7s. 6d. net.

This is the concluding portion of one of the most attractive and handy books on "British Moths" ever published. The author's name is in itself an ample guarantee of accuracy and judicious treatment, while the illustrations are, on the whole, of quite exceptional merit. Since the latter are, in the case of the adult insects, produced by the photographic three-colour process, it follows that the markings and shape of the wings are absolutely true to nature, while the colours are usually equally faithful. Some of the greens are, however, as in most cases where the three-colour process is used, not bright enough, or of a wrong shade. The text is admirably arranged, and gives just sufficient information for ordinary purposes; but the English names used on the plates would be better replaced by Latin ones, as the latter are nowadays even better known, and certainly of more value than the curious combinations of adjective and noun which occasion such names as Grey Shoulder-knot, Dingy Shears, or Ringed Carpet.

The handy size of this beautiful little book renders it possible for the collector to take it away with him to the country without inconvenience along with the companion volumes on the remainder of the Macro-Lepidoptera. Armed with the three he will have at hand a reliable, and at the same time a most readable and enjoyable, guide to the identification and life-history of his captures.



THE LATE GEORGE SIM, A.L.S.

The Annals of Scottish Natural History



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[JULY

OBITUARY—GEORGE SIM, A.L.S.

WITH PORTRAIT.

GEORGE SIM'S father James Sim, or Sime as he also wrote his name, was the son of a farmer in the parish of Grange, who died while James was a child, leaving enough to provide for his sustenance until able to earn a livelihood by his own labour. This he soon did, at first as a farm-servant, afterwards as a herring-fisher at Wick, then for some years as tenant of the farm of Netherton, in Boharm, Banffshire. Here he married the daughter of a farmer, and lived on the farm comfortably; but at the close of his lease another tenant took the farm at a higher rent; so Sim removed to Craigellachie, and began business as a general merchant, succeeding fairly well. Here he remained for some years; and here George was born on 26th March 1835. James Sim again leased a farm; but as considerable outlay had to be made on it, and he had a large family to support, he found himself unable to remain in it, so he became grieve or overseer on a farm in Marnoch for some years, moving after a time to Scobbach in Turriff; there in two years he lost five of his family by death. Others of the family were invalids; and he and his wife had a hard struggle, bravely met by them.

George had soon to help in the household, to assist his mother, burdened with the care of the invalids; and as attendance at school was not then compulsory he was often kept at home, while his own tastes led him to solitary rambles rather than to games or company of other children. Thus, although his parents were anxious to do what they could for their children, he had very little education in school as a child; and in 1848, at the age of 13, he began an apprenticeship to a tailor in Auchterless. From this time onward his opportunities for attending school ceased, apart from Sunday School, which he was expected to go to regularly, for a time, though as often as he could he gave the preference to a ramble in the woods or other homes of the wild creatures in whose ways he took a keen interest.

But much as he loved a ramble in the country, he did not neglect duty, and he was soon expert in his work. After an apprenticeship of $4\frac{1}{2}$ years he became a journeyman with the same master, and there he remained for a time. His master, when the apprenticeship began had had a good business, but an increasing love of drink brought him to ruin; and Sim found it necessary to seek work elsewhere. The experience made a deep impression on him, and led him to strive earnestly to save his fellow-workmen from the habit so disastrous to his master.

For a time he moved from one town to another in Scotland, England, and Ireland, working as a journeyman tailor. Returning to Scotland he spent some time in Glasgow, then in Turriff for a winter, then for some months in Edinburgh, and for $1\frac{1}{2}$ years in Inverness, followed by another winter in Turriff, during which he attended school. Then followed more wanderings, to Inverness, Grantown, Turriff, Dublin, and Glasgow. About 1857 he tried his fortune as a tailor on his own account in Turriff; but soon afterwards a brother who had been trained as a druggist induced him to join in the purchase of a druggist's business in Tarland, and here they spent about two years.

The brothers were both keen lovers of nature, and found the neighbourhood of Tarland afforded scope for the encouragement of their tastes rather than for pushing their business, which did not come up to their expectations, and was sold

by them. George had made a considerable collection of birds, the prizes of many a ramble, often taken during the time that should have been given to rest. He had often thought of taxidermy as a livelihood, and on leaving Tarland he resolved to supplement the experience gained in the preservation of skins for his own collection by a regular training, which he took under Mr. Sanderson, Edinburgh. After a short visit to London he came to Aberdeen in 1862, and commenced business in King Street. His success surpassed his hopes, and from this time he lived in Aberdeen, moving into a larger shop in a more prominent situation, in Castle Street, after some years. To his business as a taxidermist he added the sale of antiquarian and similar articles, of which he possessed an excellent knowledge. His integrity and skill were so relied on by all with whom he had dealings that this branch of his business extended largely.

Mr. Sim had married some time before he settled in Aberdeen, and his wife and child resided there while he tried his fortune in London. It must have been an anxious time for him until a livelihood seemed assured in the new venture; but he did not spare himself, working from an early hour until late at night, often until nearly midnight, in his shop or in the workroom beside it. Yet though so assiduous in his business, he spent many an hour in the investigation of the fauna of Aberdeen and its vicinity, often spending much or even all of the night in his rambles.

For a number of years he paid great attention to Fishes and Crustaceans; and few mornings passed without a visit to the sands between the Dee and the Don, or to the boats on their return from fishing. From the lines and from the trawl-nets many prizes were gathered, while the trawlers fished the nearer seas; but in later years the longer time spent between the fishing grounds and port resulted in the nets and decks being cleared before arrival. The fish-market was also one of Mr. Sim's favourite haunts, and strange fish were kept for him, or brought to his shop.

Results of his study of the Crustaceans and Fishes were published in 1878 in the Transactions of the Aberdeen Natural History Society in a "List of the Crustacea of the North-East Coast of Scotland," and a "Catalogue of Fish

found in the vicinity of Aberdeen by the late Dr. Dyce and George Sim." Interest in both groups continued all his life ; and he formed collections in both, which he presented to the University of Aberdeen shortly before his death.

But his love for other sides of animal life was scarcely less strong ; and the few days that he allowed himself away from the business by which he won a livelihood for himself and his family were chiefly devoted to long rambles that might well have been thought beyond his bodily strength. In these he was accustomed to carry a small spirit stove, and to cook his meals when out all day and sometimes all night. In company with one or two congenial friends he explored the coast north and south of Aberdeen, and the interior of the neighbouring counties, with a keen eye to animal life of all kinds, but interested also in geology, and in other sides of nature-study. From 1862 until 1890 he kept a systematic record of his work and observations, extending to 12 quarto books, filled with notes interspersed with neat drawings. These have been presented to the Aberdeen Free Library.

Much valuable information was gained also from the material that came under his professional care, and was carefully noted ; and books and periodical literature were diligently studied whenever opportunity could be gained, however brief. Thus he acquired a very exceptional knowledge of the larger fauna of the district around Aberdeen. Numerous short notes in the "Scottish Naturalist" and its successor the "Annals of Scottish Natural History," in the "Zoologist," and in similar journals called attention to novel or rare species that came under his notice ; and essays by him on the "History of the Herring," and the "Food of Fishes," were awarded prizes at the Fisheries Exhibitions in Edinburgh in 1882, and in London in 1883. He resolved to prepare an account of the Vertebrata of the district best known to him, and from 1890 onwards made this his special aim. Its pursuit made heavy demands on his time, and led to the giving up of the journal about 1890. In 1903 was published in Aberdeen, "The Vertebrate Fauna of Dee, including the Fishes of the East Coast from Wick to Firth of Forth," a handsome octavo, of almost 300 pages. Except a brief

introduction on the extent and physical features of the district included in "Dec," it is occupied with an account of the Vertebrata known to him from this region by personal observation, or from the work of others, whether published or communicated personally to him. It contains a very great amount of information, and its value is increased by the correction of errors in records previously published. It will remain a permanent monument to the unwearied and self-denying labours of a true naturalist, whose constant aim it was to discover and to state the truth as it appeared to him to exist, and who never spared himself in that quest.

The scanty education received in youth was felt by him in later life, but was largely made good by private study, whenever he could find time. He was an omnivorous reader, books of travels being especial favourites, but a wide range of other subjects being also studied. His wanderings as a journeyman tailor had brought him into many new scenes, had widened his outlook on life, and had strengthened his own character and his desire to help his comrades in the struggle and temptations of life. In later years he travelled in France, Italy, and other parts of Europe, visiting museums, picture galleries, and other places of interest.

Reserved and silent with strangers, or in uncongenial company, Mr. Sim was held in most esteem by those who knew him most intimately, for only they could learn to estimate aright the sterling worth of his character and the width of his information, while even to most of his friends certain kindly traits were seldom if ever revealed.

In 1886 he was elected an Associate by the Linnean Society, a recognition well deserved, and appreciated by him. He was for many years an active member and office-bearer in the Aberdeen Natural History Society, and was an Honorary-President of the vigorous Aberdeen Working Men's Natural History and Scientific Society.

He was of spare frame and almost ascetic appearance, and did not look fit to bear the unceasing activity and unsparing demands that his business and even his relaxations made on his bodily strength, but he reached the age of seventy-three, dying in his home in Aberdeen on 15th June 1908.

J. W. H. T.

THE WEIGHT AND LENGTH OF OTTERS.

By H. W. ROBINSON.

IN the last vol. of the "Annals," No. 66, Mr. Harvie-Brown, in mentioning Otters of 28 and 26 lb., concludes by saying that record weights which are authentic are desirable. As a hunter of Otters nearly all my life with many different packs of hounds, and also as a collector of information concerning the animal, from personal experience, from masters of Otter hounds, and from such publications as "The Field," perhaps some of these statistics may be of interest.

The average length of an Otter has been given in numerous works on British mammals as 44 inches, which is about right, taking dogs and bitches together. Bell gives the average weight as 20 to 24 lb. for the male, and 16 to 20 lb. for the female: the former is correct, but the latter is too heavy, being from 14 to $16\frac{1}{2}$ for the average. Still he is very near the mark, which is more than can be said of the explanatory labels on the Otter case in the Natural History Museum at South Kensington, where the weights are under the mark.

Daniel, in his "Rural Sports," is much below the mark when he gives the usual length as 39 inches, and above the mark when he says that the bitch may vary in weight from 13 to 22 lb. Anything over 25 lb. for a dog and 16 lb. for a bitch is large. Pennant mentions one as having been killed on the Lea near Ware which weighed 40 lb., and another killed by the Carmarthen hounds is given as having measured 66 inches, and said to have weighed 50 lb. Daniel says that the record was one taken in the river Lea between Hertford to Ware in October 1794 which proved "upward of 40 lb.," this being probably the same one mentioned by Pennant. Daniel also says that:—"In April 1804, the Otter hounds of Mr. Coleman of Lemonster killed in Monkland Mill Pond, an Otter of extraordinary size; it measured from the nose to the end of the tail 58 inches, and weighed $34\frac{1}{2}$ lb."

In the "Zoologist" for 1849, page 2407, Mr. M'Intosh mentions one in his possession which measured in the flesh

55½ inches from tip to tip, not stating its weight, but saying it was trapped in the Stour at Spetisbury near Blandford in Dorsetshire.

The following I quote from "The Field" as being a letter from Captain E. F. Oakley:—"The accepted record weight for an Otter is, I believe, 38 lb., but I have one in my possession, stuffed by Rowland Ward, which weighed 42 lb. (*wet, in a bag*) say 40 lb. Mr. Rowland Ward was unable to accept this as an authenticated record owing to the lack of witnesses, but said that the measurements were larger than those of the Otter which weighed 38 lb. As a matter of fact, I am satisfied myself, Captain Oakley says, that the weight was genuine, since my keeper, a most reliable man, weighed it twice carefully. He trapped it on Spencer's Oak fishing on the Blackwater, in the spring of 1898, underneath the big rock on the left bank." It was again mentioned by Captain Oakley in "The Field" of 26th September 1908. I do not doubt his word, although I take it that he got the details second-hand from his keeper, and did not actually see it weighed, or even in the flesh. If he had deducted, not 2 lb., but 6 or 7 lb., or even more, for a wet Otter in a wet bag, I venture to say that he would have been nearer the mark, and this would bring down its weight to 35 or 36 lb. I have had some experience of wet Otters in wet bags and am sure that the water in the bag and Otter combined would weigh at the very least 6 lb. Messrs. Rowland Ward, to whom I applied for the length of this Otter, replied that it was not measured, and also said that they were unable to give me any information concerning the 38 lb. one quoted in the above letter of Captain Oakley.

In Millais's "British Mammals," vol. ii., the following weights and lengths of Otters are given, the author quoting Mr. Thomas Southwell, who, I believe, mentioned the heaviest of them in "The Field" of 30th December 1895.

37 lb. and 48 in. ♂	27 lb. and 50 in. ♂	16 lb. and 43 in. ♀
30 " " 53½ " ♂	23 " " 50 " ♂	16 " " 43 " ♀
28 " " 50½ " ♂	23 " " 48 " ♂	14 " " 44 " ♀
27 " " 53 " ♂	18½ " " 49 " ♂	

Surely, some may say, there is something wrong with these figures? The largest dog, weighing 37 lb., only

measured 48 inches, being the shortest of the eight dogs mentioned, even an inch less than the $18\frac{1}{2}$ lb. dog. The two largest are a 30-pounder of $53\frac{1}{2}$ inches and a 27-pounder of 53 inches, these two being respectively $5\frac{1}{2}$ and 5 inches shorter than the great 37-pounder. Should not the 37-pounder, they may ask, have measured 58 inches instead of 48 inches, or is it that the 37 lb. is a misprint for 27 or even 17? It is not so. I am fully convinced, and I think that all masters of Otter hounds will agree with me, that a long Otter is not necessarily a heavy one and *vice versa*, the short thick ones of about 48 inches being the weight carriers.

In Squire Lomax's famous "Diary of an Otter Hunter," covering the forty-two years from 1829 to 1871, none killed were over 30 lb. in weight, his record being one of $26\frac{1}{4}$ lb. Mr. Courtenay Tracey, the oldest master of Otter hounds in the country, tells me that he has never seen an Otter of 30 lb. killed, and but a few of 29 lb., in his long experience of the sport.

My friend Mr. H. W. Clift, an ex-master of the West Cumberland hounds, who has probably had as much experience of Otter hunting as any man living, and hunted in almost every county in England, tells me that the largest Otter killed by him was on Coniston Lake, which weighed $29\frac{1}{2}$ lb. and measured 48 inches in length, being the thickest Otter he ever saw.

Personally, I have yet to see an actually weighed 30 lb. Otter killed by hounds, although one which I shall mention later, which was not weighed, must have topped that weight, but I have seen several killed and weighed between 27 and 28 lb., one of $28\frac{1}{4}$ lb., and the heaviest $28\frac{1}{2}$ lb. As a rule if there is a big Otter in a river hunted by hounds, especially so if there are many fox-hounds in the pack and the river low, he has not much chance if hounds find him lying loose, but is generally chopped at once, as he is too fat to get away; so we ought to see a good many 30-pounders killed if there were many existing.

On 10th July 1907, the Essex Otter hounds, after a four hours' hunt, killed a grand dog Otter which weighed on a Salter's spring balance 34 lb., it being found lying almost on

the sea-wall at Kirton Sluice, in Ipswich. Its length was not taken. The master told me that his next heaviest was one of 29 lb. killed at Blythburgh near Southwold, on the 28th September in the same year, and that they had killed quite a number of 28 lb. weight, none of which were measured for their length. Last year, on 3rd September 1908, the Bucks Otter hounds meeting at Trafford Bridge killed, after a seven hours' hunt, another 34 lb. otter; and during the same week yet another monster of 28 lb. after a four and a quarter hours' hunt at Haversham Mill. In answer to my inquiries concerning the lengths of these two latter, the master of the B. O. H. replied that they never *either weigh or measure* any of their Otters, so these weights, although they appeared in "The Field" hunt reports, are not of much value unless they were weighed officially, as it is very unsafe to estimate the weight of an Otter with anything like accuracy.

Captain Sheppard, a well-known ex-master, whose hunting was done chiefly in Ireland, states that his heaviest Otter weighed $29\frac{1}{2}$ lb., and goes on to say that the ordinary steel-yard is most untrustworthy, he once finding his own $3\frac{1}{2}$ lb. wrong when he fondly believed he had killed a bitch of 20 lb. I can support him in this, as I myself found that there was $4\frac{1}{2}$ lb. difference between my Salter's spring balance and a new patent American one in favour of the latter, which I fortunately had never used except to weigh some wild swans, when I found it out. On 6th February 1906, one of 35 lb., measuring 48 inches in length, was shot on the Stour at Fordwich opposite the George and Dragon Hotel by the landlord, Mr. Watson, and set up by Dabbs of Canterbury.

The Kendal Otter hounds killed one of 33 lb. in Rydal Water in August 1886. During the first week of February 1907, a large dog of 32 lb. was trapped in the Rother, near Midhurst, which measured $48\frac{3}{4}$ inches in length. Another of 32 lb. with a dry jacket was shot in the garden of the Hon. A. Holland-Hibbert at Mundun, Herts, in 1876, a photograph of which, set up in its case, appeared in the "Sporting and Dramatic News" of 6th November 1908. The heaviest I have actually come across was one shot by

my boatman in the Loch of Harray in Orkney which, weighed carefully on two different sets of scales, was 35 lb.

One killed in the English Lake district measured $50\frac{1}{2}$ inches and was said to have weighed 34 lb., but although the length is authentic, I cannot say the same for the weight. Another 32 lb. Otter was killed by the old Bishop Auckland pack when the late John Galton was master.

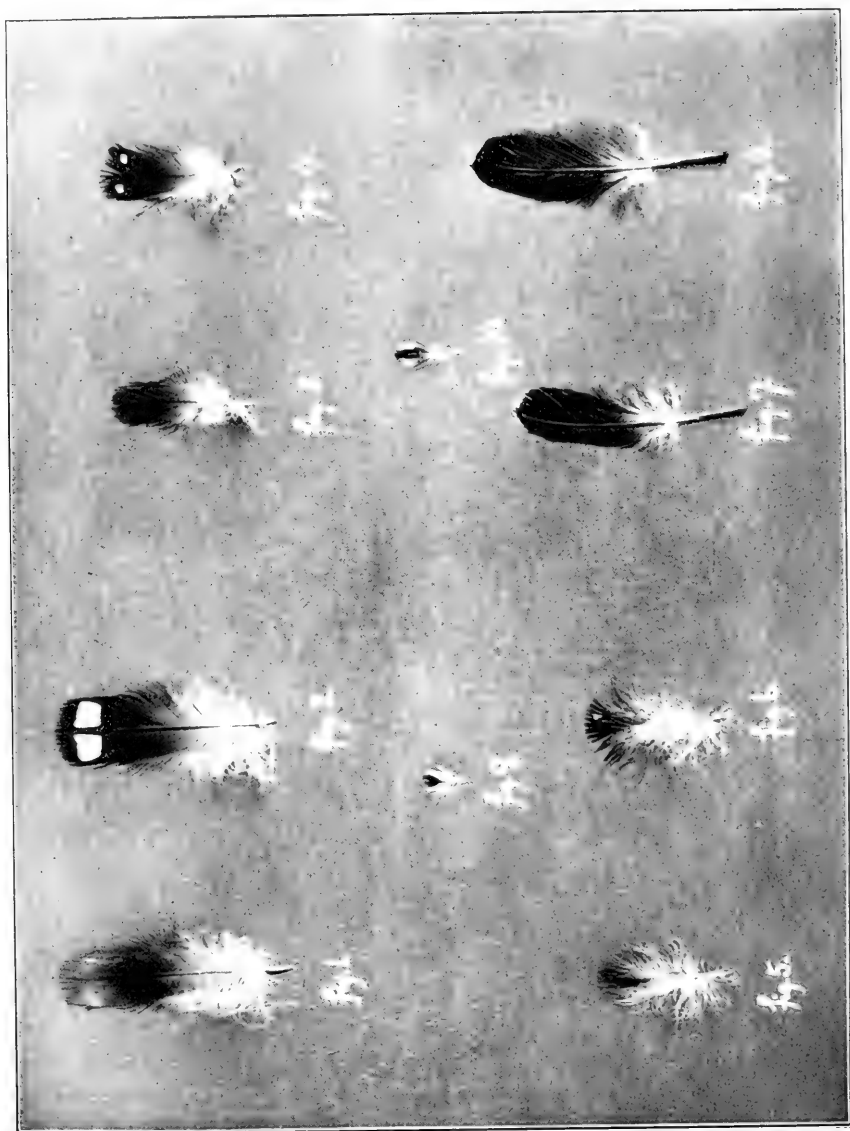
The Carlisle hounds, when hunted by Mr. Carrick, killed Otters of 31, 30, 29, and 28 lb., and Mr. Buckley's hounds in 1895 killed, in Lake Bala in Wales, one of $29\frac{1}{2}$ lb.

A 30 lb. Otter was found dead on the banks of the Wyre in North Lancashire in March 1899. On Saturday, 11th June 1904, the famous Dumfriesshire Otter hounds killed their record Otter in the Kirkcudbrightshire Dee, hunting from Tongland Bridge, he weighing $29\frac{1}{2}$ lb. and measuring $51\frac{1}{2}$ inches, but on 5th August 1908 they killed a 30 lb. dog on the Esk at Parrisfoot which had a total length of 49 inches.

One of $29\frac{3}{4}$ lb. and measuring $51\frac{1}{2}$ inches was shot on 11th November 1907, on the tidal waters of the Stour on the mud flats opposite Mistley, half a mile from shore, by a punt-gunner out after duck, and another of 29 lb. was tailed and killed near Yalding in Kent.

Last year, in September 1908, the West Cumberland Pack killed a fine dog of $28\frac{1}{2}$ lb. in the river Mite in West Cumberland, which measured 50 inches in length. The East of Scotland pack killed an enormous Otter on the Tyne near Haddington on 4th July 1906, after a nine and a half hours' hunt in deep water, which must have been nearly a record. Everybody was too tired to weigh him before he was broken up, but his length was marked on a pole by one of the field, and on measuring it afterwards we found it to be just under 60 inches. I knew the Otter well, having been at close quarters with him on more than one occasion, and he appeared to be pounds heavier than anything I have seen before or since. Even when broken up his rudder measured $3\frac{1}{2}$ inches more than normal, his mask $1\frac{1}{2}$ inches, and the girth of his upper neck $3\frac{1}{2}$ inches, the latter having a girth of $16\frac{1}{2}$ inches.

Mr. Raine of Carlisle says that the Dumfriesshire 30-



FEATHERS TO ILLUSTRATE MOULTING OF THE GREAT NORTHERN DIVER.

pounder was the heaviest he has ever set up, but that its length, 49 inches, was exceeded by a 28-pounder killed by the Carlisle hounds in the Liddle in June 1897, whose length was 51 inches.

Messrs. Williams and Sons, the well-known Dublin taxidermists, inform me that they do not think they have had any Otters of over 28 lb. through their hands, but that the largest measured 50 inches in the flesh.

LANDSDOWNE HOUSE, LANCASTER.

NOTES ON THE SEASONAL CHANGE IN THE PLUMAGE OF THE GREAT NORTHERN DIVER (*COLYMBUS GLACIALIS*).

By F. W. SMALLEY, M.B.O.U.

PLATE III.

CONSIDERING how meagre is the knowledge at present to hand concerning the changes of plumage which take place in our sea birds during the year, I feel that the following observations of the changes as noted by me in the spring moult of the Great Northern Diver may tend to throw some small ray of light on this very interesting matter.

Before proceeding farther I must make it clear that I am dealing entirely with the change of fully adult birds from their winter to their summer plumage, and although I mention the differences between adult birds and birds in their first winter plumage, I merely do so in order to enable others to clearly distinguish between young and old birds when checking my observations with any skins of *Colymbus glacialis* which they may come across or possess in their own collections.

Reference to the published plate of feathers will from time to time be necessary as indicated in the text.

The full adult winter plumage of the Great Northern Diver is a simple one, and the plumage of both sexes is alike in both winter and summer feather.



In winter the whole of the head and upper neck is mouse grey ; the chin, throat, and lower neck white ; the lores, region round the eyes and sides of the neck mouse grey intermixed in about equal proportions with white.

The feathers on the back and wings and those forming the upper tail coverts are dark blackish grey with two indistinct lighter grey spots on each feather corresponding to the white spots seen in the summer feathers of the same regions (Figs. 1 and 3).

The tail feathers are black with white tips (Fig. 7), and the wing feathers (primaries and secondaries) black. The belly pearly white, a dark mouse grey band of feathers forming a narrow V-shaped band across the vent.

The young birds in their first winter plumage are distinguished from the adult birds by having a broad light grey margin to each feather on the back, rump, and tail coverts, and an entire absence of light spots on these feathers.

The winter plumage of the adults appears to be complete but for a very short time, and the bird rapidly passes on through the following stages until the full summer plumage is completed. The first signs of change take place either on the back or on the throat, or on both places simultaneously, about December, and by the end of May the bird has assumed its full summer dress, which is as follows. The whole of the head, throat, and neck is deep glossy black with purple and green reflections ; on each side of the neck and across the throat are lateral lines of white forming transverse bars. The whole of the upper part of the body is rich glossy black, each feather with two large white roundish spots towards the tips ; the tail and primaries black, belly pearly white, and the narrow band across the vent black, each feather carrying a white spot towards the tip.

The time of year at which the summer feathers first make their appearance naturally varies in different individuals, but, generally speaking, so far as my observations go, the first new feathers begin to appear about the beginning of December, and from then onwards to May there is a gradual and continuous moult. At what time of the year precisely the Great Northern Divers cast their primaries is at present

unsettled, but it is quite certain they are much later than their cousins the Red-throated Divers (*C. septentrionalis*). These latter cast their primaries in early autumn, and are clean moulted through by the middle of November.

The Great Northern Divers are certainly several months later, and I have an adult specimen killed in Orkney on 18th Feb. 1908, in which all the primaries and secondaries are absent due to moult. I am inclined to think that these birds probably cast their primaries sometime about the New Year. During the process of the spring moult the birds assume a strangely mottled appearance, due to the new black feathers growing amongst the old mouse grey and white feathers on the head and neck, and the back apparently becomes wholly changed before the change in head and neck is completed.

The band across the vent appears to be moulted in or about the middle of the change, and is practically entirely lost for a short period, and is hardly distinguishable in specimens killed in late February and early March.

The following details respecting the individual feathers in summer and winter are worthy of note.

As already stated, the feathers in winter, covering the whole of the dorsal region, are dark mouse grey, almost dull black in colour, and there are hazy traces of two lighter grey spots, corresponding in size and shape to the white spots seen in the summer feathers. Fig. 1 represents a winter feather taken from the interscapular region. Fig. 2 represents a summer feather from the same region, the colour of which is glossy black, with two white spots, one on each side of the *rachis* and near the end of the feather.

Figs. 3 and 4 are respectively the winter and summer feathers of the *uropygium* (rump), the remarks as to colour being the same as for Figs. 1 and 2.

It is worth noting, however, that the size and shape of the white spots on the summer feathers vary somewhat, those on the feathers of the interscapular region (Fig. 2) being more or less large and rectangular in shape, whilst those of the rump and upper tail coverts are smaller and round (Fig. 4).

Fig. 5 represents a winter feather taken from the narrow

V-shaped band across the vent, and, as in Fig. 1, is dark mouse grey in colour, and spotless.

Fig. 6 is a summer feather taken from the same region, and is similar in colour to Figs. 2 and 4 with this marked difference that, whereas all the summer feathers of the dorsal region carry *two* white spots, some of those of ventral band feathers only carry *one*.

Briefly then, so far as the dorsal region and the narrow V-shaped band across the vent are concerned, the changes from winter into summer feather follow a fixed type, dark mouse grey spotless feathers in winter changing into glossy black spotted feathers in summer.

The *rectrices* (tail feathers), however, apparently show an entirely opposite state of affairs, for it will be noticed that in winter the feathers are black with a white edge to the tips (Fig. 7), and in summer are wholly black, without any white edge or spot (Fig. 8). It has been suggested to me that possibly the feathers of the tail appearing wholly black in summer may be due to abrasion, and that the white edging becomes worn completely away. This may be the explanation, but after careful examination of the material at my command, I am inclined to think that the summer tail feathers are grown wholly black from the beginning, and I come to these conclusions after carefully studying the feathers, for I find that the feathers which carry the white edging appear older and more faded in colour than those which are wholly black, and further, these wholly black feathers do not show signs of having lost, by abrasion, so broad and wide an edging as is seen in the white-edged winter feathers, and I therefore judge the wholly black feathers to be new ones, or, at any rate, newer than the white-edged winter feathers. The matter is extremely interesting, and needs further confirmation.

Figs. 9 and 10 represent the feathers taken respectively from the throat and neck-bands in summer. The general effect produced by these feathers is the formation of lateral lines of white forming three transverse bars, one on each side of the neck, and one across the *gula*. Although the effect so produced is the same in each case, on examination of the feathers it will be found that the distribution of black and

white varies: that in typical feathers from the gular band (Fig. 9), white predominates, whilst in typical feathers from the neck-bands, black predominates (Fig. 10). Dr. Elliott Coues ("Key to North American Birds," 5th ed., vol. ii. p. 1049), in describing these lateral lines, says, "The white throat-patch consists usually of five or six streaks; in this, as in the lateral neck-streaks, the individual feathers are broadly black, with sharp white edges towards their ends." Whilst this describes pretty accurately the feathers forming the transverse neck-bands (Fig. 10), it does not give a true description of the feathers forming the gular band (Fig. 9). In these latter, there is only a triangular piece of black at the tip of each white feather.

There is another point of extreme interest connected with Great Northern Divers. I refer to the nature of the feathers covering the head and neck during winter plumage. These feathers, in winter, are of a downy nature, in great contrast to the strong true feathers found on the head and neck in summer plumage. This downy state of the feathers seems not to be confined solely to the Great Northern Divers, as, upon examination, I find the same state of affairs appertaining during the winter feather, in an equally marked degree in the Black-throated Divers, and in a somewhat lesser degree in the Red-throated Divers and the Cormorants.

On examining the *Alcidæ* there is also an appreciable difference in the structure of the feathers on the head and neck in winter and summer, those in winter being of a more downy nature than those in summer, but it appears to be only in two species of the *Colymbidæ* that these winter feathers are of a purely downy nature. This downy nature of the feathers must not be put down to immaturity, as it is characteristic of the fully adult bird in winter plumage, and was, I believe, first noted in print by Mr. J. L. Bonhote ("Birds of Britain," p. 384).

On reviewing the whole matter one is at once struck by the analogy between the changes of moult seen in the Great Northern Diver, and the changes noted in the spring moult of some of the *Anatidæ*, for example the Long-tailed Duck (*H. glacialis*).

In both we notice:—

- (a) That the first feathers to show signs of the spring moult are those of the interscapular region.
- (b) That the feathers which cover the head and neck are the last to become completely changed.
- (c) That all the flight feathers are dropped simultaneously and not in pairs, and that therefore the divers as well as the ducks are deprived of the power of flight during a short period of moult.
- (d) That the period of the spring moult spreads over a considerable area of time, but that, roughly speaking, it commences in December and becomes complete in May, a period ranging through five months of the year.

Referring again to the specimen already mentioned as having been shot on 18th February in Orkney, and as having no flight feathers owing to moult, I have already expressed an opinion that the Great Northern Diver moults the primaries much later in the year than the Red-throated Diver. Furthermore one would reasonably expect the primaries to be moulted during the autumn moult.

Clear it is, that I have a specimen moulting its primaries during the spring moult. The question which naturally arises from this specimen is, Are the Great Northern Divers analogous to the Ducks in this respect? *e.g.*, as Mr. Bonhote has pointed out, in the Mallard the primaries are moulted immediately after the assumption of the "eclipse" plumage, and then, in a week or two, the assumption of the winter plumage starts. If this is so, the winter plumage of the Great Northern Divers is analogous to the "eclipse" plumage in the Ducks and the primaries are moulted immediately after the full winter plumage is assumed.

It must, however, always be borne in mind, in dealing with cases which appear out of the ordinary, that there may, very possibly, have been some physical debility in the particular specimen under notice, which may account for the apparently protracted or retarded moult. This may possibly be the explanation of my specimen being minus the flight feathers in the middle of February. The case is interesting, and further evidence on this and other matters raised in this article would be very welcome.

THE AQUATIC COLEOPTERA OF THE
SOLWAY DISTRICT.

By FRANK BALFOUR-BROWNE, M.A. (Oxon.), F.R.S.E., F.Z.S.

(Continued from p. 86.)

The total number of species compares very favourably with that of other counties. Surrey, for instance, has a list of about 135 species, while Sussex E. has about 130. The biggest list is for East Norfolk and contains about 150 species. The Cumberland List contains about 97 species and the Cheshire List about 107. Mid West Yorks, in which is the famous Askham Bog and Chaloner's Whin, only boasts about 102 species, while South Devon has 109 and East Suffolk 115. These are some examples of counties and vice-counties which have been well worked, and it is seen that the Solway district stands well in the list. It is impossible to be quite precise as to the number of species in any district owing to the recent changes which have been made in our list, *e.g.* the introduction of *Octhebius viridis*, Peyr., *Laccobius sinuatus*, Mots., *Helophorus porculus*, Bedel, etc., as additional species, previously mixed with others in our cabinets.

The most remarkable point about the Solway Water-beetle fauna is the Southern-British element which it contains, of which the following are examples:—*Bidessus minutissimus*, Germ.; *Berosus signaticollis*, Charp. (Lennon); *Helophorus nulsanti*, Rye [= *dorsalis*, Marsh] (Lennon, Sharp, etc.); *Octhebius auriculatus*, Rey (Lennon, etc.); *O. lejolisii*, Rey and Muls. The records for *B. minutissimus* in Britain are at present few in number. It was first found in the river Lee, at Cork, by Clear, and recorded by Wollaston as a new species, *H. trifasciatus* ['Descriptions of three newly discovered British Species of Coleoptera,' "Ann. Nat. Hist.," xviii. 452-3, 1846]. For some reason Wollaston later doubted the origin of Clear's specimens ('Capture in Devon of *B. minutissimus*,' "EMM." vi. 57, 1869), so that the Irish record was of little value. It was, however, rediscovered in Ireland about 1900, by Halbert,

who took specimens in the river Sheen, near Kenmare (Kerry S.), and also a single specimen in Co. Dublin ("I. Nat.," ix. 278-284, 1900). In July 1907, I rediscovered the species in the river Lee, Cork, thus confirming Clear's record ("I. Nat.," xvi., September 1907). In England the species has only been taken in South Devon, and, until in 1907 Mr. Philip de la Garde took 6 specimens in the river Teign ("EMM.," ser. 2, xix. 14-15, 1908), it had only been taken in Slapton Ley.

My discovery of the species in Scotland came about in the following way. In September 1907 I was collecting near the river Ken, Kirkcudbrightshire, when I came across a backwater of the river with grass growing at the edge and lying out on the water. This was the habitat of the species in the river Lee, so, without really expecting to find the species, I worked the grass along the edge. Had the first haul not produced a specimen, I doubt whether the species could now be added to the Scottish List, because, after all, there was no reason for expecting to find it there. However, one specimen did turn up in the first haul, and I got a few more specimens later. A few days later I visited the Nith, where I took 11 specimens in two or three hours. I tried one or two smaller rivers, such as the Urr at Dalbeattie, but without success, chiefly perhaps because a suitable habitat could not be found. In August 1908 I took 16 specimens in four hauls of the net in the Luce Water, near Glenluce, Wigtownshire; but although I found a likely place in the river Annan (Dumfriesshire), and worked for nearly an hour in October, I could not find the species.¹ It only occurred on one short stretch of the Nith on the Kirkcudbrightshire side, so that it has only been found in Wigtownshire and Kirkcudbrightshire.

Helophorus dorsalis, Marsh (= *mulsanti*, Rye), occurs commonly in the brackish pools by the Nith below Kelton, and until 1907 this was the only Scottish locality. I have since then taken it on the Preston Merse, Southwick, Kirkcudbrightshire, although not so commonly as at Kelton.

¹ This may, however, have no special significance as to distribution, as I failed to find it in the Nith last year, although I worked the same place as I had found it at in the previous year.

Fowler records this species as having been taken commonly by Crotch at Liverpool, but it seems to have disappeared from the modern Lancashire Lists. There is, however, a specimen in the Chitty Collection at Oxford labelled "Liverpool, Power!" Except for this record and one or two inland ones, *e.g.* Derby and Oxford, which, considering that the species is distinctly maritime, must surely be wrong, the range of the species, as at present known, is entirely south-eastern, from Hants S. to Norfolk E., but not recorded for either Essex or Suffolk. The species also occurs in Ireland, and has been taken in Co. Down by the late Mr. Buckle and by myself.

I first took a single specimen of *Octhebius auriculatus*, at Kelton, in June 1906, and I found it there again in August 1907. I did not, however, recognise it then, as I had not seen the species and thought my specimens were *O. rufimarginatus*, Steph. So far, I have only taken 5 specimens, but I found 3 specimens in the Lennon Collection mixed with *O. bicolor*, Germ. This species has only been recorded from Sussex E. and Kent E. in England, but it has been taken in Cos. Meath and Dublin in Ireland.¹

Octhebius lejolisii, I only discovered in the Solway district in October last. When in Dublin, at the British Association Meeting, Professor Hudson Beare and I went to Dalkey on Mr. Halbert's instructions to find this species in the rock pools. After vainly searching for a considerable time, we at last found it in very small holes of clean salt water, and with the imagines we found the larvæ. The pools were just above high-water mark and held a pint or less of water. At high tide they were splashed by the sea, as we found to our cost. The sea was just settling down after a violent storm, which would perhaps account for the fact that the water in the pools appeared to be pure seawater. Having once discovered the beetles walking on the sides and bottoms of the pools, they were not difficult to find. After the British Association Meeting I went to West Donegal, and there, both at Dunfanaghy and at

¹ The species occurs as far north as Borkum Island on the west coast of Europe. Since going to press I have seen specimens from Lincs N. (Rev. A. Thornley), so, possibly, the species occurs all up the east coast of England.

Bunbeg, I found the species even more abundant than at Dublin, under exactly similar conditions, except that the water in the pools was practically fresh, probably owing to the fact that the weather was exceptionally wet. In October I went to Bangor (Co. Down) where I at once found the species, but much scarcer than at Donegal, mostly in clear salt water; but a few were in pools of stale sea-water. I then went to Kirkcudbrightshire, and at Douglas Hall I found 9 specimens in as many minutes, in extremely small rock pools, and on returning to Ireland I found the species again at Larne (Co. Antrim).

It was first found in Britain by Mr. W. H. Bennett, at Ilfracombe, "in putrid sea-water pools" ("EMM.," ser. 2, vi. 181, 1895), and has since been taken in that county (N. and S. Devon), in E. and W. Cornwall and in N. Somerset, by Messrs. J. H. Keys, G. C. Champion and others. It has also been taken in Carmarthenshire (Llanstephen), as I saw specimens from there in the collection of Mr. Kidson Taylor.

It is, perhaps, a fact of some significance that all these 5 southern British species which have turned up in the south-west corner of Scotland are also found in Ireland. They perhaps all belong to that group of the British fauna known as Lusitanian (see R. F. Scharff, 'The History of the European Fauna,' "Contemp. Sci. Series," 287-308, 1899; and "European Animals," Arch. Constable and Co., 1907). The fact that three of these species have been recorded for places on the western coast of England, *i.e.*, *B. signaticollis*, *H. dorsalis (mulsanti)*, and *O. lejolisii*, is suggestive that possibly they—and other members of the same group—may be discovered all along that coast wherever suitable habitat offers. That they are confined in Scotland to the south-western corner is also improbable, and there seems no reason why they should not yet be discovered among the Western Isles, as other members of the Lusitanian group have been found there.

Besides the four species in the Lusitanian group, which constitute new Scottish records, two other records in the following list are of special interest. *Celambus versicolor*, Schall, has, so far as I know, only been once previously

recorded for Scotland (Berwickshire, Andrew Murray, 1853). There is, however, a single specimen of this species in the Dublin Museum Collection labelled "Royal Botanic Garden, Edinburgh, 1864" (M'Nab). I only found the species at one spot on the river Dee, Kirkcudbrightshire, where, however, it was distinctly common. It occurs in Northumberland, Durham, Yorks, and Lancs S., but has not so far been recorded from Cumberland, so that the northern counties of England and the southern counties of Scotland would appear to be its northern limit in Britain.

The other record of interest is *Rhantus pulverosus*, Steph., of which, however, I only took one specimen! The only other Scottish record is one of Little's, for Forfarshire, which, however, Dr. Sharp regarded as doubtful. It has been taken in Lancs S., and Durham, so that possibly my single specimen should be regarded as an individual which has exceeded the normal bounds of distribution of the species.

When Canon Fowler published his book on the "British Coleoptera" (1887), *Agabus affinis*, Payk, was only known to occur "near Dumfries." Whether the species has since rapidly increased its range, or whether the absence of other records at that time was due to confusion with *A. unguicularis*, Thoms., it is impossible to say, but the species is now very widely distributed in Great Britain, and occurs also in Ireland.

It had been previously recorded for "near Glasgow," Andrew Murray, 1853; Renfrewshire, "local but very abundant," Morris Young ("Ent. Weekly Intelligencer," i. 166, 1856); and Fifeshire, Andrew Murray, 1853; but these records had all been swept aside by Dr. Sharp, who said "specimens of *A. unguicularis* have usually been mistaken for this species" ("Col. of Scotland," 1871-78).

At the time of the publication of my paper on these two species ("Ent. Rec.," xviii. 1906), *A. affinis* had been recorded from Clackmannan (A. Beaumont, "Scott. Nat.," ix. 1887-88); Warwickshire (H. Willoughby Ellis, "Vict. County History," 1904); Edinburgh (Wm. Evans, "Ann. Scott. Nat. Hist.," ix. 91, 1900 (taken in 1896), and T. H. Beare, "Ent. Rec.," xv. 49, 1903); and Berwick (T. H. Beare, "Ent. Rec.," xv. 181, 1903); and I have since found

that several records of *A. unguicularis* really referred to this species.

I have seen English specimens of *A. affinis* from Cornwall, E. (Clark); Devon, S. (J. H. Keys); Essex, S. (E. A. Newbery); Warwick (H. W. Ellis); Cheshire (J. H. Bailey and J. F. Dutton); Cumberland (F. H. Day); and Surrey (H. Donisthorpe and E. C. Bedwell).

In Cornwall both *affinis* and *unguicularis* have been taken and recorded as the latter. In Devon and Cumberland apparently only *affinis* has occurred, but the record is for *unguicularis*. I have no record of *unguicularis* for Essex, the record of *affinis* being for a single specimen from Epping kindly sent me by Mr. E. A. Newbery. In Warwick both *affinis* and *unguicularis* were recorded, but apparently only *affinis* has occurred. In Cheshire only *unguicularis* has been recorded, but, thanks to Mr. Dutton, I have seen specimens of both species from there.

The Surrey specimens are interesting. Up to 1902 neither species had been taken, but from 1903 onwards Messrs. Donisthorpe and Bedwell have taken one of them freely, always at Oxshott. The species has been recorded as *unguicularis*, but all the specimens in the collections of these gentlemen are *affinis*.

A. affinis is very common all through the Solway district, chiefly in sphagnum pools on peat mosses. I have also taken it commonly in Ayrshire, Renfrew, Dumbarton, and Forfar, and have seen specimens from Clackmannan.

A. unguicularis, which is at present the common species in England, is fairly widely distributed in Scotland, although in the Solway district it has only turned up in four localities in Kirkcudbrightshire. I have taken it in Stirling and Forfar, and Dr. Sharp took it in Edinburgh and Haddington, and there are also records for Clackmannan and East Inverness. It is, however, I think, the rarer of the two species in Scotland.

The following is the full list of Solway species. Where I have taken the species myself I give no other authority. The *black* type indicates the county record, and the *smaller* type gives the localities where the species occurred.

- Brychius elevatus*, *Panz.*—**Dumfries**, R. Annan ; **Kirkeudbright**, R. Nith, R. Dee, etc.
- [*Halipus obliquus*, *F.*—**Kirkeudbright**, “Glen Mill Burn” (Lennon).]?
- H. confinis*, *Steph.*—**Kirkeudbright**, Lochrutton Loch only, but fairly common.
- H. flavicollis*, *Sturm.*—**Dumfries**, R. Lochar ; **Kirkeudbright**, Lochrutton L., L. Arthur, Culloch L., R. Nith, R. Ken, R. Dee.
- H. fulvus*, *F.*—**Kirkeudbright**, Lochrutton L., R. Ken, Dalbeattie, R. Nith, etc. ; **Wigtown**, R. Cree, Water of Luce.
- H. ruficollis*, *De G.*—**Dumfries**, **Kirkeudbright**, **Wigtown**; common.
- H. fluviatilis*, *Aubé.*—**Kirkeudbright**, R. Nith, R. Urr, etc.
- H. striatus*, *Sharp.*—**Dumfries**, Caerlaverock and Kelton (Lennon and Sharp) ; **Kirkeudbright**, Kirkconnel (Lennon).
- H. lineatocollis*, *Marsh.*—**Dumfries**, **Kirkeudbright**, **Wigtown**; common.
- Laccophilus interruptus*, *Panz.*—**Kirkeudbright**, 1 only, R. Nith (Lennon).
- L. obscurus*, *Panz.*—[**Dumfries**, Auchencrieff L. (Lennon)]? ; **Kirkeudbright**, Lochrutton L., Carlingwark L., Rockcliffe, scarce.
- Bidessus minutissimus*, *Germ.*—**Kirkeudbright**, R. Nith, R. Ken ; **Wigtown**, Water of Luce.
- Hyphydrus ovatus*, *L.*—**Dumfries**, Auchencrieff L. (Lennon) ; **Kirkeudbright**, Clonyard L., Carlingwark L., Ken Bridge.
- Coelambus versicolor*, *Schall.*—**Kirkeudbright**, R. Dee (Thieve Bridge).
- C. 5-lineatus*, *Zett.*—**Kirkeudbright**, Lochrutton L., Culloch L., Carlingwark L., Ken Bridge.
- C. inæqualis*, *F.*—**Dumfries**, **Kirkeudbright**, **Wigtown**.
- C. confluens*, *F.*—**Dumfries**, one only, Caerlaverock Salt Marsh (Lennon).
- C. 9-lineatus*, *Steph.*—**Kirkeudbright**, Lochrutton L., Lochaber L., L. Arthur, White Loch, Colvend, L. Ken, R. Dee (Thieve Bridge).
- C. impressopunctatus*, *Schall.*—**Dumfries**, one specimen, Caerlaverock Salt Marsh ; **Kirkeudbright**, one only, Dalbeattie.
- Deronectes latus*, *Steph.*—“Solway” (Sharp).
- D. assimilis*, *Payk.*—**Dumfries**, R. Lochar ; **Kirkeudbright**, Lochrutton L., L. Arthur, Lochaber L., Clonyard L., Maxwelltown L., R. Nith ; **Wigtown**, R. Cree.

- D. depressus, *F.*—**Dumfries, Kirkeudbright, Wigtown**; common in running water.
- D. 12-pustulatus, *Ol.*—**Dumfries, R. Annan; Kirkeudbright, R. Nith, Carlingwark L., R. Dee, etc.; Wigtown**; not uncommon, but usually only in autumn.
- Hydroporus pictus*, *F.*—**Dumfries, Racks Moss, Lochar Moss, Bankend; Kirkeudbright, Maxwelltown L., Clonyard L., Dalbeattie L., Ken Bridge, R. Dee; Wigtown, R. Cree**; local and not common.
- H. granularis, *L.*—**Kirkeudbright, Maxwelltown L., Rockcliffe; Wigtown, nr. Kirkcovan.** Fairly common where it occurs.
- H. lepidus, *Ol.*—**Dumfries, Racks Moss, Lochar Moss, Bankend; Kirkeudbright, Barclosh Peat Moss, Dalbeattie, Duff's L.; Wigtown, one only, Water of Luce**; abundant in many large deep peat holes, otherwise generally scarce.
- H. rivalis, *Gyll.*—**Dumfries, Kirkeudbright, Wigtown**, common in gravelly streams.
- H. septentrionalis, *Gyll.*—**Dumfries, Kirkeudbright, Wigtown**; chiefly found in the larger streams in gravelly parts.
- H. davisii, *Curt.*—**Dumfries, Well-burn, Moffat; Kirkeudbright, near Carsethorn (Lennon)**; I failed to find it anywhere about Carsethorn.
- H. lineatus, *F.*—**Kirkeudbright, Lochrutton L., and a few ponds about the county**; not common.
- H. tristis, *Payk.*—**Dumfries, Kirkeudbright, Wigtown**; peat bogs at any altitude; common.
- H. umbrosus, *Gyll.*—**Dumfries, Kirkeudbright, Wigtown**; fairly common.
- H. angustatus, *Sturm.*—**Kirkeudbright, Dalskairth, Castle Douglas, Dalbeattie; Wigtown, near Newton Stewart**; only a few specimens.
- H. gyllenhalii, *Schiödt.*—**Dumfries, Kirkeudbright, Wigtown**; the dominant peat-bog species up to about 1000 feet altitude.
- H. morio, *Dej.*—**Kirkeudbright, Criffel, etc., the dominant peat-bog species above 1000 feet altitude.**
- H. vittula, *Er.*—**Dumfries, Kirkeudbright, Wigtown**; fairly common.
- H. palustris, *L.*—**Dumfries, Kirkeudbright, Wigtown.**
- H. incognitus, *Sharp.*—**Dumfries, Kirkeudbright, Wigtown**; chiefly in large peat holes in some of which it swarms.

(*To be continued.*)

THE FALSE-SCORPIONS OF SCOTLAND.

By ROBERT GODFREY, M.A.

*(Continued from p. 26.)****Chelifer caneroides*** (Linn.), 1761.

On the 2nd of April 1907, while sifting some hay-seed and refuse from a stable loft in Emily Street, Glasgow, I obtained a single specimen of *Chelifer caneroides*. A week later, with the help of the stableman, Mr. Alick Wilson, I examined the loft with great care, and, after long search, we came on a colony of the species living on a discarded piece of harness buried in the hayseed. Some of the specimens were very immature, but most of them were adult, and at least one seemed to be ready to lay her eggs. On the 29th of April, accompanied by Robert Whyte, I returned a third time to the loft, and together we obtained other eighteen specimens. By beating pieces of old harness sharply on the ground, we shook the creatures out of their recesses; and by cutting up the harness we found other individuals concealed in the narrow interstices between the strips of leather. We also succeeded in discovering the discarded moulting nests, placed between strips of leather that had been tightly sewn together. The nests were closed elliptical rings, 2 millimetres by 3 millimetres in cross diameter, of dust particles, within which was the inner silken lining appressed throughout the extent of both upper and under surfaces against the leather. Two of the nests contained the remains of moults.

I gave the stable a rest for two months, and returned on June 28 to hunt for the female with young. The previous ravages on the loft had evidently told on the colony, but I obtained other three from old harness, and the stableman unearthed a small wooden board, which proved to be haunted by the species. In all we took nine specimens. Of these, four were fully adult, and all males. Of the other five, two were females, swollen, but showing no external sign of the embryonic mass. Either the season for the appearance of the egg-mass had not yet arrived, or, what is more likely, the adult females were snugly hidden in cracks of the wood or elsewhere.

In a second stable loft, in Walls Street, Glasgow, on the same afternoon, I found an adult male resting on the outside of a small wooden box; later, on September 14, 1907, Aird Whyte and I visited this stable, and devoted our attention to one of the horse-stalls: we found adults and young that had but lately entered on a free life living in company with *Ch. panzeri*.

I put five of the specimens obtained on June 28 into a bottle

with some chaff and left it in my room. Periodically afterwards, on examining the bottle, I could see two or even three on the inner side of the glass. On September 13 I emptied out the bottle, and discovered that four of the inmates were moving about as actively as ever, though they had had no food since they had been made prisoners. In searching for the fifth I noticed parts of a silken nest fitted into the dense spike of a withered head of grass or other plant. The nest was partially covered with such pieces of chaff and dirt as the little builder could obtain. Inside was the fifth *Ch. cancroides*, guarding with her open nippers the entrance I had made. I tried patiently to induce her to show me her under side, but she clung so tenaciously to her home that I could not attain this end without destroying the nest. Still it was necessary for me to know whether she had her embryo mass, and I had to force her out. She was still swollen, but showed no external sign of the embryo mass; yet I thought it possible that she had built the nest for reproductive purposes, but it proved afterwards that she had done so for moulting.

At any rate Mr. Wallis Kew has succeeded in proving that this species builds a nest for reproductive purposes; in August 1907 he found in a stable in Essex two females in cocoons with their embryonic mass attached.

Among hay-seed and refuse *Ch. cancroides* is hampered in its movements, but on a level surface it walks at ease. Its normal line of progression is forward, the pedipalps being held so as to form a rude semicircle and the nippers being expanded. It keeps its body clear of the ground, but when tampered with it squats and lets its pedipalps droop or draws them back. When in danger *Ch. cancroides* moves sideways and backwards as well as forwards; but, when compelled to take a sideward line of retreat, it soon alters its position so as to face the danger and to retreat in a direct backward line from it.

When at rest with pedipalps fully drawn back, the long femurs lie back over the fore-body, their distal ends touching, the tibiæ are generally at right angles to the femurs, and the great hand nippers parallel to the femurs.

Chelifer latreillii (Leach), 1817.

This species was described by Leach in 1817, but his type remained unique, as far as Great Britain was concerned, until the discovery of Scottish specimens by Mr. H. Crowther in 1882. Mr. Crowther found three individuals on the promontory at North Berwick, their proximity to the sea being such that at high tide the spray was constantly thrown on the cracked igneous rock that sheltered them.

After prolonged hunting for this species on both shores of the

Forth, I rediscovered on May 23, 1905, the habitat at North Berwick in which Mr. Crowther had first found them. Just below the promontory proper and adjoining the swimming pond and harbour is a strip of low-lying porphyritic rock, whose surface is scarred and torn in every direction. Here in the crevices between the fragments of rock *Chelifer latreillii* lives. Most of the thirteen individuals seen were adult, but an immature specimen closely approaching in tint the colour of the rock was also observed. Some old nests in which individuals had moulted were attached to the fragments of rock, and a single occupied nest contained a young individual that may not have emerged from its hibernating quarters. This last nest was an elliptic ring, about four millimetres by two, formed of particles of grit agglutinated, with an inner lining of light silk; it was placed between two appressed rock-fragments and formed quite a safe retreat for the inmate.

This rediscovery of the original habitat of *Chelifer latreillii* was followed by the discovery of other haunts, indicating the abundance of this species on certain parts of our coast-line. To the west of North Berwick, at Gullane Point, in the cracks and crevices of the natural rock I saw many on October 14, 1905; a number of the immature individuals were dwelling alone in large cocoons, and had already in my opinion entered on hibernation. At the same spot, on November 10, 1906, adults and young were found hibernating solitarily in cocoons, and other adults were resting in a free condition in the joints of the rock.

On the opposite shore of the Forth, near Elie, Mr. Evans took two specimens in July 1905, and, on 14th September, George Barbour and I near the same place found over twenty specimens and many empty nests in cracks of the natural rock just above high-water. And at Kilminning, in the East Neuk of Fife, during September 1905, George Barbour and I met with the species abundantly under stones on a fine pebbly subsoil a few yards above tide-mark; and on 11th November of the same year I found five individuals living free in the rock crevices of Rosyth promontory.

My delay in finding *Chelifer latreillii* in Scotland is partly explained by a preconceived notion that it would be found in haunts similar to those in which it is known to occur in England and in France. Mr. Wallis Kew had informed me that on the treeless sand-hills and warrens of the Lincolnshire coast it occurs in abundance under pieces of wood and other objects lying on the sand or sandy soil, as well as under the bark of maimed stumps of sea-buckthorn and elder, and of dead branches of these bushes in fences. There can hardly be any doubt but that it occurs in similar situations in Scotland, but our present information shows that it prefers here natural rocky ground close to the sea.

When exposed to the light *Chelifer latreillii* remains for a while

inactive, with its pedipalps drawn back to the sides of the fore-body, and, if tampered with, it moves slowly backwards, still retaining its pedipalps in the retracted position. If undisturbed, however, it gradually stretches its pedipalps outward and forwards, and opening the fingers wide, begins to move along by jerky stages of five or six paces, then settles down into a regular travelling movement. No species lends itself to observation so readily as this one, and individuals kept in captivity have allowed me to determine for myself the use of the serrula and the method of feeding—both of which are detailed in the introductory portion. In the fields I have watched one carry off in its chelicerae a beetle¹ as long as itself. Mr. Wallis Kew tells me that he has seen it, in captivity, catch with its great hands and afterwards suck out the juices of *Chthoniuss tetrachelatus*; he has also seen it preying on *Chthoniuss rayi*; and among the insects which it caught with great dexterity were five specimens of the active little wasp-like Hymenopterous parasite which is commonly bred from cocoons of weevils of the genus *Cionus*. *Chelifer latreillii* is of social habits, numbers being found in close proximity.

The nests of this species, used for moulting and for hibernation, are large and generally placed between two closely-appressed pieces of rock; they are formed of earth with a silk lining and with a silken floor and roof attached to the stones. The creature may exceptionally take possession of a natural hole in the rock, and cover the mouth with silk without any earth; in one such case, on my inserting a pin, the adult creature within showed fight, and tackling the pin with its great nippers emerged from its nest-hole after it; shortly afterwards it again disappeared into the hole, but when disturbed a second time and forced to come out, it refused to return. In September we found nests containing the cast-off moult, and on the 7th of the month we examined a nest, three by five millimetres, containing both a moult and a creature within it.

No nest is made for reproductive purposes. I first observed this in my captive specimens, one of which on June 27 was wandering about freely with her embryonic mass attached to the under side of her hind-body. I do not think the eggs had been produced earlier than June 21, as I had not noticed anything peculiar about her on that day. On June 30 the mass appeared to be developing well, but on July 13—after my return from a trip to St. Kilda—I found the chelifer clean, without any trace of her embryonic mass. She was still alive, however, and was active till August 30 at least; she had received no food since her capture, but beyond being much thinner after her experiences, did not appear greatly inconvenienced by her imprisonment. On August 1 I examined her dwelling carefully and found what I took to be the discarded embryonic mass; it was so shrivelled up, however, that I could make nothing of it.

¹ Identified for me as *Tachyporus chrysomelinus* by Dr. D. Sharp.

In their natural condition also the females are free while carrying their mass of eggs or embryonic young. Moreover, on September 5, 1905, at Kilminning, I found one, a female, moving about with ten young ones which had attained their definitive form, seated on the under surface of her hind-body. She stood or walked with the front of the fore-body almost touching the ground, and her emaciated hind-body raised in a concave arch above the ground. The young were seated with their heads outwards; the outer young were clinging to the inner, and one youngster wandered over the upper surface of its parent.

***Cheiridium museorum* (Leach), 1817.**

This, the smallest of our British species, measuring just over one millimetre in length, has its proper home in stables and hay-lofts, where it occurs among the hay-seed as well as on pieces of wood and stones covered with dust and spiders' webs; it also lives in houses, but its presence there is rarely suspected unless when it wanders from the cracks of the furniture in which it passes its existence to books, or to collections of dried plants or natural history objects.

My introduction to this species came in quite an unexpected fashion. While busy writing a sermon in my room at Bankhead, Bo'ness, on June 20, 1901, I noticed a little brownish-red speck on the Bible that lay open before me, and was surprised to see that it was a live specimen of the long-looked-for Book-scorpion. In its movements it resembled other species previously known to me, walking with its pedipalps held well forward, and altering their position or retracting them on the slightest suspicion of danger. Repeatedly I put my pencil in front of it, taking care, however, not to touch it, and it always showed its sensitiveness to the presence of the pencil point by drawing back its pedipalps, and at the same time moving backwards. When I followed it up, the little creature continued to retreat before my pencil, of whose presence it seemed to be quite conscious before actual contact took place. When I blew on the creature, it drew its pincers quite close to its head, and appeared then like a small speck of brownish-red dirt.

Four years afterwards, almost to the very day, June 21, 1905, I discovered that a large colony had been living unknown to me in my own house in Cumberland Street, Edinburgh. Our kitchen bunker had to be removed to allow of some repairs being effected on the wall, and was judged so aged and decayed as to be undeserving a place in the house any longer; it had been in the house during the twenty-four years of our occupancy, and was probably fifty years old at least. Before removing it to a cellar, I had pulled off a plank that had overlapped the back of the bunker to prevent articles falling down between it and the wall, and I instinctively examined the under side of the plank. It was literally covered with

typical false-scorpion nests, little dust-covered blotches on the wood. In subdued excitement I proceeded to open these with a pin, and in the second nest opened I exposed an adult *Cheiridium museorum* with her embryonic young attached to her under surface. On this strip of wood were a hundred and seventy-three nests, with sixteen more on the portion of the bunker-lid which it had covered. On examining the two planks more carefully next morning I noticed a number of dead specimens lying on the wood, and two brightly coloured adults besides a few immature individuals moving among the dust. By testing one of these live specimens I assured myself that their sense of touch lies in the fine hairs of the great nippers.

On March 26, 1906, in breaking up an old chest brought by my brother James from Smeaton, East Lothian, two days previously, I discovered many nests of this species in the woodwork, and found one colourless individual moving free.

In September 1905 another important clue to this creature's habits was obtained at Crail, Fifeshire. While a guest of Dr. Barbour at Kirkmay House, I received a letter from Mr. Wallis Kew suggesting a search for False-scorpions in stables, and, on September 9, George Barbour and I visited the stable-loft to look for these creatures. Almost at once George found two specimens of *Cheiridium museorum* on a loose stone lying under the rafters, and in a very short time we obtained fifty-five specimens. These were mainly found under the thick layers of dust and cobwebs that covered stones and boards, but a few were obtained by sifting the hay-seed. On subsequent visits to the loft we discovered that *Ch. museorum* was common among the hay-seed and the refuse in the loft corners. By shaking this stuff over a stone, and blowing upon it, we saw many of the tiny chestnut-coloured specks left behind on the stone. We also saw the nests quite numerous on the wood as well as on the stones; in three of these we found live creatures, and in thirteen of them we saw the cast-off moults.

Following up this clue, I obtained a single dead specimen in refuse from a flour-mill at Stravithie on September 25, 1905; and five specimens at the farm of Newhouse, Dunbar, in May 1906,—four being on a piece of wood in a barn, and the fifth under a stone in a shed. In April 1907, G. A. and R. B. Whyte informed me of the extraordinary abundance of this species in the barns at Grange, Keswick, and gave me full proof of their statement during a stay of a few days with them in the locality. In hay-lofts and in barns the species swarmed on dust-covered stones and old wood, as many as sixty individuals being found on a single stone. On some of the stones favoured by the False-scorpion there also occurred in abundance a small Mite; and each creature seemed, to a slight extent at least, to be profiting from the other's presence. One *Ch. museorum*

was carrying a Mite in its chelicerae; and on the other hand, a living Mite was occupying a discarded nest, in which the False-scorpion's moult remained. Stones and wood were thickly dotted with the minute nests of this False-scorpion.

The nests vary in size from just over one millimetre to two millimetres in diameter, and are formed of two thin layers of fine silk, one of which is attached to the surface of the wood or stone, and the second of which forms a hemispherical dome over the first. In rare cases the nest is formed of silk only, but in most cases it is covered with a coating of tiny particles of wood or of dust. The nests are used for the various purposes of moulting, rearing young, and resting (rather than hibernating). As already indicated, adult females with their embryonic young attached have come under my notice in the nest; but in three of the nests on our bunker lid in Edinburgh there were embryonic masses of five, four, and two young respectively without any attendant adult. In no other False-scorpion's nest had I found the eggs or the undeveloped young without their parent, and I hesitated to put this fact on record without fuller evidence. I noticed, however, that in the case of an adult carrying four embryonic young, the larval mass was easily detached, and did not therefore appear to be in any vital relation with the parent; and in April 1907, G. A. Whyte at Keswick made a further observation on this point. He opened several nests, each of which contained three colourless young individuals which had attained their definitive form, but had no adult beside them. One such nest with its three young he opened in my presence. And again on October 19, 1907, at Haswellsykes, Peebles, he confirmed his Keswick experience by finding another nest of this species containing three young without any adult.

The number of young in this species varies from two to five.

***Ideoroncus cambridgii* (L. Koch), 1873.**

So far as present Scottish records indicate, this species is restricted to the west coast, but it is safe to say that its known haunts afford us no exact estimate of the creature's range. The first specimens, three in number, were obtained by myself in a rocky wood at Barbreck on the shores of Loch Awe, June 30, 1900; they were living in the crannies of the rock under a thin covering of earth and vegetation. A fourth Argyllshire specimen, fully adult, and presented to me by its captor, was taken by Rev. James Waterston on April 23, 1903, on the under side of a stone deeply imbedded in the soil on the south-western slope of Ben Cruachan.

Since then, this species has been proved to be commonly distributed along the west coast from the Kyle of Lochalsh to the Solway Firth. At Balmacara, Ross-shire, Aird and Robert Whyte

and I found it on natural rocky ground throughout a considerable area, in August 1906. At Oban, in April 1906, we took it not only on the mainland, but also on the Maiden Island and on Kerrera. Farther south, on the shores of Loch Fyne at Shirvan, Henry Drummond Simpson and I, during August and September 1904, found many specimens on the stony hillsides both of the open and of the woodland; and at Ronachan in Cantire I obtained four individuals at Christmas 1905.

Meantime I had discovered another stronghold of the species among the rocks at Portincross Castle in Ayrshire. From November 7, 1903, to April 2, 1904, I have entries of eighty-two specimens in my note-book. The Ayrshire haunt of *I. cambridgii* is the tree-clad cliff-foot that skirts the shore; here the ground is in a natural condition with many stones imbedded in the earth or rudely jumbled together, and with a soft and somewhat marshy soil; under the stones *I. cambridgii* dwells. In the extreme south of Scotland also, at Kippford in Kirkcudbrightshire, we obtained five specimens in January 1907, taking two of these on the small Rough Island.

Its main haunts are on rocky hillsides, both by the shore and inland, where it is most generally found under tightly-imbedded stones. It has, however, been procured on driftwood also, in company with *Chernes dubius* and *Chthonius rayi*, by Robert Whyte; and it has been obtained among leaves, in company with *O. muscorum*, by the same naturalist.

This species is not so active as *O. muscorum*, although, so far as its free life is concerned, it possesses similar habits. Its mode of progression is a slow advance with extended nippers; in making its way between little blobs of soil, it twists its pedipalps simultaneously, now to right, now to left, to suit the necessary line of progress, and, on touching any suspicious object, it retracts them and runs backwards. When prodded behind, it turns slowly.

I. cambridgii preys on tiny worms and springtails. Although I have seen this species five times with its prey, I have never seen it using its great nippers in handling the food at all; I have not, however, witnessed the full process of capture in this species. Once I disturbed an *I. cambridgii* with a small whitish worm of about its own length and as thick as the False-scorpion's fore-body; it was holding the worm by the middle in its chelicerae, and had already sucked one half. It began to move off, carrying the worm with it, lying over its left chelicera and along the left side of its carapace; and, as it walked, it jerked out a minute dot of chalky excrement from its anus. It carried its prey quite easily and moved slowly about with it till it discovered a convenient ball of earth under which to retire; but, on being disturbed by me a second time, it left its prey and retreated backwards.

On another occasion, August 22, 1906, Robert Whyte and I watched for a full hour an *I. cambridgii* carrying an Annelid in its chelicerae. During all this time the False-scorpion never once used its great nippers. At first the Annelid was juicy and actively writhed under the grip of the False-scorpion; later it shrivelled into a dry thin stick, but even in this condition was still carried about by the False-scorpion. As the False-scorpion gave no sign of removing the remains of its feast from its chelicerae, we at length used a pin to force it to quit the Annelid, but for four minutes we played with the False-scorpion before we could compel it to drop the dried-up worm. During the time we watched it, the False-scorpion kept constantly on the move, having its great nippers open as it prowled about.

The existence of a nest for any purpose whatever in this species has yet to be proved. All the creatures found so far—and the only months in which I have not seen them are May, July, and October—have been living free. Neither adults nor young appear to hibernate; at Portincross, from January 14 to the end of March 1904, I saw numbers of immature examples, in the colourless condition of those just beginning a free life, moving about actively under the stones. The adults also, though rather inert, were leading free lives throughout the winter.

The time and the manner of moulting are still unknown, though probably this part at least of the animal's life-history takes place inside a nest.

It still also remains an open question whether or not this species makes a nest for reproductive purposes. Very immature youngsters are to be met with in September, as well as in January, February, and March; but the female has not yet been observed carrying her eggs or embryonic mass.

***Obisium maritimum*, Leach, 1817.**

Two important facts connected with *O. maritimum* bestow upon it an interest which is not attached to our other British species. The first is its distribution, which, so far as I have ascertained, is confined to Great Britain, the Isle of Man, and the Channel Islands. The second is its habitat, which normally lies between tide-marks.

Mr. Wallis Kew has very kindly transcribed for me the recorded history of the species from its discovery by Montagu to the present time. It appears to have been taken first (for there is hardly any doubt that this species is indicated) in Cornwall "on the rocks contiguous to the sea," whence it was described and figured by Montagu in a paper read before the Linnean Society in 1807, and published in 1815. Leach, in 1817, described and figured it under the name it now bears, and says of it, "Habitat in Angliâ occidentali inter

rupes ad littora maris. Communicavit Dom. C. Prideaux." The exact locality is not given and the figure is poor; but the type is preserved in the British Museum, labelled, "West of England, C. Prideaux, Esq." No further reference appears to occur till 1869, when M'Intyre published an article on "Pseudo-scorpions" in Hardwicke's "Science Gossip," and mentioned a large *Obisium*, which is almost undoubtedly *O. maritimum*, and which was taken at Plymouth by Mr. C. Stewart, who found it rather abundantly below high-water mark. In such a situation, it is added, the animals would nearly always be submerged, "but doubtless the crannies of the rocks which it inhabits always contain a certain amount of air." Later, in 1892, Mr. Pickard-Cambridge, in figuring and describing the species anew, stated that he had received it from the Devonshire coast, where it was found by Mr. Bignell of Stonehouse, Plymouth, under stones below high-water mark; and also from Mr. Sinel from a similar situation in Jersey.

In March 1905, Mr. Pickard-Cambridge informed me that he had lately received this species from the Isle of Man; and in June Mr. Wallis Kew told me he had had it from St. Ives, Cornwall, where it was collected by Mr. F. W. Wilson.

While a guest with Professor, now Sir Alexander, Simpson at Shirvan, Argyll, in September 1904, I discovered this species somewhat commonly between tide-marks just below the house. Henry Simpson and I had gone down to fish, but, on taking out the boat, we considered the wind too strong, and, giving up our purpose, we returned to land again. While Henry fastened the boat, I turned over a few stones, and on the under surface of the second or third stone I detected a large dark-coloured False-scorpion, which in the shape of its great nippers resembled *I. cambridgii*. A few seconds of suppressed excitement, while I brought my lens to bear on the eyes, were followed, when I saw that the creature had four eyes, by that indescribable joy which accompanies the finding of long-sought treasure. I knew that I had found *Obisium maritimum*, and I was conscious as I gazed on it of being highly privileged in seeing in its native haunts a creature which so few naturalists had looked on before. My young companion entered into the excitement of the moment, and together we carried on an enthusiastic hunt, and found other eight specimens. On subsequent days I spent much time studying the species and seeking to work out its life-history. Altogether, twenty-three individuals were noticed, living at from a few feet to several yards below high-water mark. Their home is under stones firmly set in the matrix of sand and shells, where in some cases their haunts may remain comparatively dry when the tide is in, but in others their retreats must be soaking with sea-water for the greater part of the day. It is probable, however, that their choice of tightly-fitting stones is not so much for the

purpose of escaping from the sea-water as for the sake of the air enclosed in these crannies.

Obisium maritimum rests with its pedipalps drawn back, so that the nippers are close to the front of the fore-body, and keeps its nippers expanded as if to receive visitors. In moving, it holds its pedipalps, still kept open, well forward, and with the tips of its nippers it taps the tiny shells and other material in its way as if testing them. It is less regardful of interruptions placed in its path than the land species are, and is less inclined to retreat from an obstacle. When it thinks fit, however, it moves easily backwards, and can run actively backwards or forwards, and at times retreats into very narrow crevices of the stones. I did not succeed in observing them catch their prey, nor could I discover what they preyed upon. One moved over a number of springtails without taking any notice of them.

Obisium maritimum forms nests for the purposes of reproduction and moulting. Whether or not it also forms a nest for the purpose of hibernation remains a matter for future investigation. The nest is a tough cocoon of white silk, fastened on the under side of a stone, and lying between the stone and the matrix below. In the nests that came under my observation there was no external covering of earth whatever; the slight pieces of dirt attached to the white silk seemed purely accidental. Yet the nest of *O. maritimum* is not, in spite of its white colour, glaringly conspicuous, but might easily be passed over as a piece of quartz or other white mineral substance embedded in the stone. In a nest found September 24, 1904, was a female with her embryonic young—at least eleven in number—attached in the form of a hemispherical mass to the under side of her hind-body. The embryonic mass forms one whole, of irregular outline, each embryo being distinctly marked off from the others. Each embryo appears to lie in a thin white sheath of its own, and to be connected vitally with the living female.

Under the same stone was a second nest of the same nature, measuring 5.5 mm. across by 4 mm. in another direction; it was slit open along one side, and contained the moulted fore-body of one of these creatures, but the moult was carried off by the wind before I had subjected it to the examination I should have liked.

The second Scottish record for *O. maritimum* was obtained on August 27, 1907, at Balmacara, West Ross, when, after a long search, a single immature female was captured. It was moving freely on the under surface of a stone set in the sandy mud some distance below the high-tide line. In spite of a continued search, no more specimens were discovered.

(*To be continued.*)

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND
FERNs FOUND AT A THOUSAND METRES AND
UPWARDS ON THE MOUNTAINS OF THE BRITISH
ISLES, WITH AUTHENTIC REFERENCES AND CRITI-
CAL NOTES.

By FREDERIC N. WILLIAMS, F.L.S.

(Continued from p. 114.)

Fam. 25. CARYOPHYLLACEÆ—Continued.

90. *Sagina intermedia*, Fenzl in Ledeb., "Fl. Rossica," i. 339 (1842).—Syn. *Spergula saginoides*, var. *nivalis*, Lindbl., in "Physiogr. Sallsk. Tidskr." 328 (1837-38), et in Flora, xxiv. 587 (1841), ex parte; *Sagina nivalis*, Fries, "Novit. Fl. Suecic. Mant." iii. 31 (1842), ex parte; *Sagina nivalis*, var. β *laxa*, Lindb., in "Bot. Nat." 1845, 66; *S. nivalis*, auctt. angl.; *Spergula saginoides*, Hook., "Fl. Bor. Amer." ex parte, sed non L. (1753). An examination of what is understood by the names quoted of Lindblom and of Fries leads to the conclusion that these authors include under this name both *S. nivalis* and *S. cæspitosa*, Vahl (= *Sagina cæspitosa*, Lange, "Consp. fl. Grœnl." i. 22). As *Sagina nivalis*, Fries, and *Sagina intermedia*, Fenzl, are both of the same date, and as there is some doubt about the status of the former, and none whatever about what is meant by the latter, it is better to use the name of a plant of which the application is certain, and that is what I have done here in the case of the Scottish plant. The following is Fenzl's original description:—"Cæspitans, glaberrima, cauliculis subsimplicibus haud radican- tibus, 1-2-floris; foliis carnosissimis lineari-subulatis, acutis, muticis vel mucronulatis; floribus omnibus vel plurimis tetrameris (paucissimis pentameris immixtis); calycis laciniis ovalibus vel subrotundis; petalis ovalibus ellipticisve calyce subbrevioribus; staminibus 8 vel 4 saltem pluribus." Fenzl's name is from the fact that it seemed to be a plant intermediate between *S. procumbens* and *S. Linnæi*. On the other hand, *Sagina cæspitosa*, Lange, is not found south of the Arctic Circle. The figure of *S. nivalis* in Syme, "Engl. Botany," t. 250, is very bad, and gives no idea of the Scottish plant. First recorded by Watson, in "Journ. Bot." 1863, 355. "Mr. Boswell Syme has shown to me a specimen of this Arctic plant picked on Ben Lawers several years ago by Prof. Balfour." It is still another instance of the extreme botanical interest of this famous Scottish mountain. There is good reason for believing, however, that it was first gathered in Scotland by R. K. Greville before 1840 (see

"Trans. Proc. Bot. Soc. Edin." xiii. 95). Balfour's specimens are actually dated August 25, 1847.

The plant occurs in bare places on alpine ridges on Ben Lawers between 946-1022 m., and up to 1060 m. on Ben Ein (Messrs. Marshall and Hanbury, *ex* "Fl. Perthsh." 86). On bare rocks near the summit of Ben Lawers (R. Lindsay, in "Trans. Proc. Bot. Soc. Edinb." xxi. 104 [1898])—this is much higher than the level given in "Fl. Perthsh." Ben Lawers ("Herb. Kew." dated 1864), and up to 1000 m. (P. Ewing, 1901).

91. *Cerastium triviale*, Link, var. *alpinum*, Mert. & Koch, in Röhl. "Fl. Deutschl." ed. 3, iii. 336 (1831).—Ascends to 1067 m. on Ben Ein (E. S. Marshall, 1889, in Herb. Brit.) in dry places. Ascends to 1100 m. on the Grampians of Aberdeenshire (Watson in Herb. Kew.). This is a variety with larger flowers and longer fruit. Probably the form which is found at 946 m. on Carn Tual (H. C. Hart) also belongs here.

Syn.—*C. fontanum*, Baumg., "Enum. Stirp. Transsilv." i. 425 (1816); *C. triviale*, var. *alpestre*, Hegetschw., "Fl. Schweiz," 436 (1840); *C. vulgatum*, var. *alpinum*, Grenier, "Monogr. Cerast." 40 (1841); *C. vulgatum*, var. β *alpinum*, et var. γ *macrocarpum*, Fenzl in Ledeb., "Fl. Rossica," i. 409 (1842); *C. macrocarpum*, Schur, in "Verhandl. Naturf. Ver. Siebenb." ii. 177, nomen solum (1851), *l.c.* x. 131 (1859); *C. longirostre*, Wichura, in "Jahresber. schlesisch. Gesell." xxxii. 75 (1854); *C. alpestre*, Schur, in "Verhandl. Naturf. Ver. Brünn," xv. 1876, ii. 151 (1877); *C. triviale*, var. *fontanum*, Rouy et Fouc., "Fl. de France," iii. 207 (1896); *C. triviale*, var. *longirostre*, Groves, in Bab., "Man. Brit. Bot." ed. 9, 65 (1904).

The following description (varietal characters only) is adapted from Fenzl:—Dense ac longe pilosum latifolium, pilis rigidulis patentissimis quandoque ferrugineis hirsutissimum. Turiones plerumque plures adscendentes elongati ramosi polyphylli. Caudiculi simplicissimi haud vel vix fasciculiferi, cauliculis validis. Folia turionum caulinaque infima lanceolata; reliqua lata oblonga vel ovata. Cyma 3-10-flora. Calyx 8-10 mm. Petala oblongo-cuneata, ungue glabra vel interdum subciliata. Capsula (in forma longirostrata) demum ad 16-20 mm.

92. *Cerastium alpinum*, L.—On grassy alpine slopes and rocks, ascends to the summit of Ben Lawers ("Fl. Perthsh." 81). Northern precipices of Cairn Gorm, at 1160 m. (A. Ley, 1874, in Herb. Brit.). It is found on mica-slate rocks on most of the higher Scottish mountains (Syme, "Engl. Botany," ii. 85). Ben Ein at 1006 m. and upwards (E. S. Marshall, 1889, in Herb. Brit.). I am unable to separate from the type *C. lanatum*, Lamk., "Encycl. Meth." i. 680 (1783), *C. pilosum*, Horn., "Hort. Hafn." add. 965 (1819), *C. latifolium* (non L.) Lamk. *l.c.* (1783), *C. villosum* Baumg., "Enum. Stirp. Transsilv." i. 424 (1816), *C. alpinum*, var.

piloso-pubescent, Syme, *l.c.*, *C. mutabile*, var. *alpicola*, Grenier, "Monogr. Cerast." 71 (1841). There is a series of intermediates varying in the amount of indumentum, until it is reduced to a minimum in *C. alpinum*, var. *glabrum*, W. "Sp. Plant." ii. 815 (1799), an arctic and high alpine form not found on the Scottish mountains. Ben Dearg (in Ross-shire) up to 1006 m. (G. C. Druce, 1902).

Var. *compactum*, Bab. Man. ed. 8 (1881).—At 1026 m. on Ben Nevis (J. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]). Ben Ein, at 1006-1066 m. (E. S. Marshall, 1889, in Herb. Brit.), and associated with the other forms of *C. alpinum* on Ben Lawers (E. S. Marshall *ex* F. B. White, "Fl. Perthsh." 81). Stob-Coire-an-Easain, Glen Spean, at 1037 m. (E. S. Marshall, 1896, in Herb. Brit.). On the highest parts of Snowdon (Banks, 1773, in Herb. Brit.).

Syn.—*C. latifolium* (non L.) Smith, "Fl. Britannica," 501 (1800), Hartman, "Skand. Fl." ed. 11, 239 (1879); *C. tomentosum* (non L.) Hudson, "Fl. Anglica," 176 (1762); *C. arcticum*, Lange, in "Fl. Danica," t. 2963 (1880); *C. alpinum*, var. *arcticum*, auctt. recent.

J. M. Norman, in "Vidensk. Selsk. Forhandl. Christiania," 1893 ("Fl. Arctic. Norveg." p. 16), considers this plant to be a hybrid. Certainly its characters are not very distinctive.

93. *Cerastium trigynum*, Vill. (1789).—First found on Ben Nevis by James Dickson in 1792 ("Trans. Linn. Soc." ii. 290 [1793]). Upon mountains to the north of Invercauld (J. F. Mackay *ex* Smith, "Engl. Flora," ii. 305). Specimens in herb. Sowerby, used for the figure of *Stellaria cerastioides* in "English Botany," t. 911 (Aug. 1801), labelled in J. F. Mackay's handwriting, "On Ben Nevis, 1794," that is, two years after its first discovery by Dickson. Ascends to 1153 m. on the Grampians of Inverness-shire (Watson, "Cyb. Brit. Comp." 124). Ascends to 1220 m. on the Grampians of Aberdeenshire (Dickie, 29).

Var. *nivale*, Williams. Ben Nevis (?). To this probably belongs an example in Herb. Brit. labelled by G. Don, "On Ben Nevis by the side of rivulets: this is a rare plant." It differs from the type chiefly in the leaves being pilescent instead of glabrous. Also on Braeriach, on the western side, in Glen Eunnich (G. C. Druce in "Journ. Bot." 1889, 203).

Syn.—*C. nivale*, G. Don, *ex* Nyman, "Consp. fl. Eur." 110; Groves in Bab. "Man." ed. 9, 67.

94. *Stellaria uliginosa* Murr. (1770).—Ascends to 1000 m. in wet places on Glas Thulachan (F. B. White), and to 1005 m. on the Grampians of Inverness-shire (Watson, in Herb. Kew.). Descends to sea-level in Cork.

Fam. 26. POLYGONACEÆ.

95. *Rumex acetosa*, L.—Ascends to the summits of Ben Lawers and Ben Alder (F. B. White), and to 1037 m. in Glen Spean (E. S. Marshall, in "Journ. Bot." 1897, 70). Ascends to the summits of Carn Tual and Beenkeragh, and descends to sea-level (H. C. Hart).

96. *Rumex acetosella*, L.—Common on the mountains of the Breadalbane district, up to 1006 m. ("Fl. Perthsh." 261). Summit of Ben Lawers, where, however, "it rarely flowers" (R. Brown, 1794, in Herb. Brit.). Ascends to the summit of Carn Tual (H. C. Hart). Descends to sea-level in Cork.

97. *Oxyria digyna*, Hill.—Ascends to 1190 m. on Ben Lawers ("Fl. Perthsh." 262). Ben Lawers (Herb. Brit. ex herb. Gourlie, 1841). Ascends to 1216 m. on the Grampians of Aberdeenshire (Watson). Descends to 168 m. in Kerry. Summit of Snowdon (Herb. Brit. ex herb. Mrs. Robinson).

98. *Polygonum viviparum*, L.—Ascends to the summit of Ben Lawers (Watson, "Geogr. Distrib. Brit. Pl." [1835], 73; Hamilton, in Herb. Brit.). Descends to 150 m. in Sligo.

Fam. 27. SALICACEÆ.

99. *Salix caprea*, L.—Attains a higher level in Scotland than any of the other tree-willows, but falls far short of 1000 m. Common in woods and on river-banks, it ascends to 610 m. on hills of the Atholl district of Perthshire, which is the limit of its altitudinal range in Britain. The sallow descends to sea-level in Cork.

100. *Salix Lapponum*, L.—Ascends to 1130 m. on Loch-na-gar (Dickie). A really alpine willow which rarely descends below 610 m. by mountain rocks and streams.

101. *Salix myrsinites*, L.—On mountain ledges high up on Ben Achallader;—the first reference in this List to this mountain. First recorded as a British plant, "upon the Highland mountains, as upon Ben-Achulader, in Glenurchy," by J. Stuart (Lightfoot, "Fl. Scotica," ii. [1777], 599).

102. *Salix herbacea*, L.—One of the most abundant plants towards the summits of nearly all the Highland mountains which exceed 730 m. in height ("Cyb. Brit." ii. 407). Common on ledges and ridges on many of the higher mountains (F. B. White). On the summit of Cairn Gorm of Derry (Dr. J. W. H. Trail). On the summits of the loftiest mountains . . . in a micaceous soil (Smith, "English Fl." iv. 200). Ascends to the summit of Ben Lawers ("Fl. Perthsh." 279), and of Ben Macdhuì (Watson, 1832, in Herb. Kew.). Ascends to 1026 m. on Ben Nevis

(G. Sadler in "Trans. Proc. Bot. Soc. Edinb." xiii. 50-54 [1878]), and to 1130 m. on Ben-na-Bourd (Watson, 1832, in Herb. Kew.). On the ridges of Ben Dearg, in Ross-shire (G. C. Druce in "Ann. Scott. Nat. Hist." 1903, 232). Descends to 265 m. in Donegal.

103. *Salix reticulata*, L.—Ascends to 1067 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 280).

NEW AND RARE MOSSES FROM THE WEST OF SCOTLAND.

By JAMES STIRTON, M.D.

AS a first item in this paper I shall describe a moss which shows characteristics similar to those indicated in *Cynodontium Jenneri* (Sch.) alluded to in the number of these "Annals" for April 1906, as well as to those of *Ceratodon vialis* (Strn.) described in the "Annals" for April 1905. In these, the cells have areas almost exactly four times those of their prototypes. Why such a difference should invariably hold I cannot explain. The late Prof. Schimper of Strasbourg, the greatest bryologist of his time, recognised this peculiarity, and gave effect to it by elevating *C. Jenneri* from its prototype *C. polycarpum* to the rank of a species. I have followed suit as regards *Ceratodon vialis*, whose prototype is the world-wide *C. purpureus* (L.). I now add a third, whose prototype is the rather common *Dicranoweissia cirrhata* (L.).

Dicranoweissia Sutherlandi (Strn.). In rather lax, convex tufts of a deep green above, dark brown or nearly black below; stems slender, simple or dichotomously branched, from a third to an inch in length; leaves rather closely arranged around stem, crisped and curled when dry, widely spreading or arcuato-recurved when wet, especially near and at apex, from a slightly or scarcely wider base, lanceolate, acute, margin in lower half, more especially on one side, reflexed in the middle from .022-.05 mm., plane and entire thereafter, not papillose; nerve pale, then of a peculiar fulvous colour from near base almost to summit, narrow, latit. near base from .04-.05 mm., thin, tapering, and vanishing below acute apex; cells at central base hyaline, oblong, attached with thickish walls, .04-.06 by .011-.016 mm., nearly

of the same size throughout base or lowest fourth, a little shorter towards margin, gradually lessening upwards transversely into the large chlorophyllose, sharply quadrate cells, .013-.018, or even .02 by .01-.014 mm.; apothecia on a rather short pale seta, elliptical, or narrowly so, lid slightly convex, red, prolonged into a slender yellow or reddish acumen from a half to nearly the length of capsule, teeth long, red, 16, barred and papillose. Propagula are seen rather frequently attached to the lower ends of leaves, elliptical, (4-6)-septate, with 2-4 irregularly longitudinal septa, chlorophyllose, then nearly hyaline, .13-.22 by .04-.055 mm. There are still two, if not three, minor differences between this moss and its prototype which I have not fully investigated, to the discussion of which I may return.

On the bark of an old apple tree in the garden of Southbar house, near Renfrew, the property of Mr. R. Sutherland, to whom I have dedicated this moss; near New Galloway, by Mr. J. M'Andrew; detected in one of my more recent collections from Ben Lawers.

As my experience of the nature of mosses increases, I am becoming more strongly impressed to the effect that there is an alternation of generation between these propagula and spores, that the propagation of spores implies a greater vital energy on the part of the plant to produce them, and that accordingly it becomes necessary at certain intervals for such an alternation to occur in order to restore the balance of energy, and that during this stage of comparative quiescence these propagula are produced, and serve the purpose not only of allowing this quiescence to continue, but to increase the vegetative powers of the plant by generating new and improved individuals. Besides, I am becoming of the opinion that differences in the common areolation of the leaf, such as are indicated above, serve the purpose, *inter alia*, of diverting this energy in new directions, so as to produce, by means of these propagula, variations in type, and ultimately to serve the purpose of producing new varieties, as well as of giving new types, a proportion of which become permanent. My thoughts in this direction have been strengthened by observing that *Ulota phyllantha*, which has hitherto been almost entirely

propagated by means of these propagula, is now beginning to produce capsules in greater proportion as time goes on ; while the propagula, although still produced, are seldom matured, but fall off at an early stage, and at times are scarcely perceptible at the apices of leaves.

Last year, during the months of August and September, at Onich on Loch Linnhe, I spent a considerable portion of my time in investigating its moss flora. What interested me most was the presence, in great profusion, of species belonging to what is now recognised as the genus *Mollia*. Although I scarcely agree with the extended limits proposed for this genus, it is a fairly natural one. The section of this genus to which I wish more particularly to draw attention is that in which *M. tortuosa* may be reckoned the type. One of the main features of distinction in this section is the peculiar acumen from the apex of the leaf. This has very generally been reckoned a mere extension of the nerve ; but it differs in constitution very materially from the nerve, wherein the long, very slender, tube-like cells, traversing the latter in a dense, opaque medium, are very characteristic. This acumen presents a flat, narrowly triangular space, with the acute apex upwards. It is much broader below than the nerve at its junction with the latter, and shows besides a clear, homogeneous, hyaline or tawny matrix, in which are seen long, narrowly elliptical or fusiform cells rather widely detached from one another, containing at first chlorophyll, then becoming merely granular, and not infrequently showing a nearly translucent appearance.

In *Mollia tortuosa* this acumen is much longer than in the others allied to it, and varies in length from .15 mm. to four times that length, and shows besides very generally bluntish hyaline spines on its surface. In this section such is almost unique. For the second time in all my lengthened experience of cryptogamic botany this otherwise very common moss was discovered in fine fruit. Along with it, and often growing intermixed, was detected *M. thrausta* (Strn.). This moss is readily distinguished from the former by the long, narrow, nearly linear upper part of the leaf, length 1.5-.2 by .12 mm., terminating in a very short, nearly triangular acumen of the same structure as already indicated, length

from .03-.09 mm. The leaves besides are very fragile, scarcely an entire apex to be found except amongst the apical leaves or those recently formed. This moss was named by Lorentz at a later date *M. tortuosa*, var. *fragilifolia*. It is, however, a species proper. The tufts of this moss are dense, but the stems are short, varying in length from a quarter to half an inch long, and almost always fastigiato-ramose above, while the whole plant presents a dull, non-glistening aspect, quite a contrast in this respect to the others. As I have already stated, it grows often in close relationships to the former, but preserves its peculiarities intact.

Another moss under this section was also discovered near Onich in fine fruit, viz. *M. inclinata* (Hedw.), the first fertile specimen gathered in this country. It is especially known by its bent capsule, which besides is nearly twice the breadth near the base that it shows near the summit. Besides the two or three stations already known in Great Britain, I have to record another from Craig Challeach, Killin.

In connection with mosses of this tribe, I have to state that *M. aggregata* (Strn.), discovered near Tarbert in Harris, is in all likelihood merely a curious form of *M. fragilis*, where the margin is rendered entire and smooth by the extension upwards to apex of a single marginal row of hyaline cells from the basal areolation. I have *M. fragilis* from Ben Lawers, where it is plentiful, showing at times this marginal peculiarity, viz. extending far up the leaf, although in no one instance actually reaching the summit.

This gives another illustration of the curious relationships of mosses of the west coast of Scotland more especially, to those on the eastern shores of Labrador, where indeed *M. fragilis* (Drum.) was first detected by Drummond himself.

In addition to the mosses to which reference has already been made, I have to record two others under a different section of the same genus, of which *M. brachydontia* may be said to be the type, and where the acumen is nearly identical in structure with the others.

Mollia intumescens, n.sp.—In large, very dense, generally convex tufts, as much occasionally as 1 foot in diameter, of a bright green colour above, with a narrow belt just beneath of a pale yellow, the rest below of a dingy, dark or dusky

red, slightly radiculose ; stems very slender, pale, from 1 to 2 inches long, simple or dichotomously branched ; leaves rather closely arranged around the stem, incurved when dry, spreading somewhat but straight when wet, concave throughout in front, clasping at base, narrow, slightly expanded and oblong at the point of attachment, then lanceolate and tapering to a narrow point on nerve, rarely slightly convex there, nerve pale, slender, smooth, and projecting behind ; latit. near base, .04-.06 mm., tapering upwards, the acumen or extruded portion very long, one-eighth or one-fourth the length of leaf proper, flat, breadth at its junction below with nerve about .045 mm., tapering to an acute point, length from .15-.34 mm., containing the detached narrow cells in a clear homogeneous matrix as already described ; margin of leaf slightly undulated, finely crenulated, plane, but very generally inflexed on both sides in the upper third to the extent of .013 mm., while the nerve and acumen remain in a straight line ; cells at central base attached, long, narrow, hyaline, .06-.08 by .006-8 mm., nearer or at margin, of still narrower cells as well as a little *longer*, all ending gradually and transversely into the upper dense, close, quadrate cells, at first .007-9 mm., nearer apex .005-8 mm., minutely papillose, but here and there papillæ scarcely perceptible. Only archegonia with very few paraphyses have been seen at the apices of stems, with the inner perichætal leaves much shorter and a little broader. On earth in a wood behind Onich, plentiful.

The next is quite unlike the preceding in general appearance, and there is, besides, a wide divergence in the minute organisation of the leaves, which, however, in general contour show a rather strong resemblance to one another.

Mollia conspersa.—In large laxly aggregated tufts or groups, of a dingy or dusky green colour above, rufous or rusty-red below, slightly radiculose ; leaves laxly disposed around the stem, almost interruptedly so, with detached rosettes of large leaves at intervals, and minute, rather acute leaves between, incurved when dry, widely spreading, almost reflexed when moist, oblongo-lanceolate, from a rather wider, pale or hyaline, somewhat clasping base, acutely acuminate above, pagina of either side ceasing at an acutish

angle on the nerve, which is excurrent in a sharply pointed acumen of the same structure as in the preceding, breadth at point of attachment to leaf from .045-.06 mm., and length from .12-.24 mm.; nerve pale, strong, at length reddish, almost convex in front, prominent and smooth behind, latit. near base, .07-.1 mm., tapering and ceasing at base of acumen, margin plane, crenulate and papillose; basal hyaline cells occupying one-third of leaf, oblong or oblongo-hexagonal in double layer, attached, large, .055-.085 by .01-.015 mm., becoming narrower towards margin, but nearly as long, ceasing transversely upwardly, but not infrequently a single marginal row of basal cells proceeding farther up than the rest, cells immediately above the basal very dark, with numerous bright points, oblong and detached, .02-.03 by .006-.9 mm., the upper cells appearing granular and chlorophyllose at first sight, but rendered very obscure on both sides by crowds of papillæ, exactly as in *Tortula muralis*; accordingly upper part of pagina is thickened to the extent of .025 mm., or nearly double the thickness near the base or lower third. Such cells can only become clearly defined by making thin cross sections of the leaf, when they are seen to have their long diameter in an antero-posterior direction or across the pagina, and are nearly hyaline, length from .015-.02 mm., the latter dimension in cells near the nerve. Unless such a section is made the contained particles of chlorophyll are apt to be mistaken for cells. The upper third of the pagina of both sides is very generally incurved so as to allow the margins to approach one another, while the nerve and its extension remain in a straight line. On the ground in several places near the sea, Onich, September 1908.

I have given a detailed description of the minute structure of the leaf, as I strongly suspect that this is a *Tortula*. The absence of fruit renders me uncertain.

As an instance in an opposite direction as regards this acumen, I shall describe another species under the same genus where this acumen is of the same constitution as those already described, but where it is always short and stump-like, and tends to disappear entirely even on leaves of the same stem, when the nerve is seen to cease below the round summit of the leaf.

(To be continued.)

SAXIFRAGA CÆSPITOSA, L., AS A SCOTTISH SPECIES.

By ARTHUR BENNETT.

DR. WILLIAMS' note (*l.c.* p. 109) on this interesting species seems rather bare, and I propose to offer a few notes on its distribution in Scotland.

Dr. Trail in his 'Top. Bot. of Scotland,' "Ann. Scot. N. Hist." (1898), 168, gives,

90?. 92?. 94. 96. 97. In 'Add. and Corr.,' *l.c.* (1906), p. 40, no further note is added.

90. FORFAR.

This seems to have been recorded on the supposition that one of Don's plants was to be referred here.

92. ABERDEEN S.

"In August 1830 Mr. M'Nab of the Edinburgh Botanic Garden found at the base of the precipice (east side of Ben-a-Buird) a tuft of *S. cæspitosa*, portions of which he gave to me, as I was near when he happened to find it."—"Macgillivray's Nat. History of Deeside" (1855), p. 127.

"Beinn-a-Bhùird consists of two tops, the north one being 3924 ft. (Aberdeen and Banff); and the south one 3860 ft. (Aberdeen). They are $1\frac{3}{4}$ miles apart."¹

94. BANFF.

Formerly referred to Aberdeen, but correspondence with Mr. F. Webb and Mr. H. C. Watson caused Mr. Watson to refer it to Banff. The specimens were collected on 3rd August 1830, on Ben Avon, by Dr. Martin Barry, and I possess two of the specimens then gathered. They are most certainly the true arctic plant of Greenland!, Iceland!, and Lapland.

The group of mountains called Ben Avon comprises four heads in Banff (3075 to 3554 ft.), and two in Aberdeen and Banff (3625 and 3662 ft.), Ben Avon itself being 3843 ft. in altitude (Munro, *l.c.*).

¹ H. I. Munro in "Scot. Mount. Club Journ." (1891), p. 300.

96. EASTERNESS.

"Mountain north of Loch Laggan," Dr. F. B. White, *in litt.*

"Glen Spean, August 1886, with Scottish Alpine Bot. Club," A. H. Evans, *sp.*

The name of the mountain was withheld, but it varies from 3422 ft. to 3437 ft. This exactly matches Dr. Barry's specimens.

97. WESTERNESS.

In Mr. Borrer's herbarium at Kew are specimens gathered by Joseph Wood "among the rocks near the summit of Ben Nevis." These Dr. B. Syme considered to be the true plant. I have not seen them.

I have a specimen named "*S. cæspitosa*, L., alt. 3500 ft., Ben Lawers, Perthshire, Aug. 1892, A. B. Hall." I cannot so regard it, but it may be the subsp. *grænlandica*.

With reference to the Carnarvon specimens, I possess two gathered by Dr. Roberts of Bangor (evidently very old, as the ink is much faded), given me by Mr. Griffiths of Bangor. They are localised from "nr. Twll-du," no date.

According to the "Biog. Index of Brit. and Irish Botanists" (1893), p. 143, this Dr. Roberts died before 1828. They do resemble the Ben Lawers example, and may so belong, but are not the same as Dr. Barry's specimens.

Then with regard to Irish specimens so named from the coast of Donegal (Crosfield, *leg.*), by Mr. N. E. Brown with a ! appended, Mr. Baker wrote on these, "Crosfield's Saxifrage is exactly *affinis* of Don and Mackay."

Mr. Brown adds, "certainly not."

Here again I say not the true arctic *cæspitosa*, nor like it.

Thus there seem to be certainly two counties (Banff and Inverness) in which the true plant has occurred.

With regard to its first record, Mr. Clarke's, "Smith, Fl. Brit. ii. 455, 1800," refers only to the Welsh specimens. Smith also in his "Eng. Fl." ii. (1828), 274, has only Welsh and Irish plants; and expresses the opinion that Hooker ("Fl. Scot." 1821) has confounded many things under that name. Hooker ("Brit. Fl." 1830, 196) has a long note on Smith's remarks, but no Scotch locality. But in his third ed.

(1835), 201, he gives "Aberdeenshire, Dr. Graham," adding in the fifth ed. (1842), 130, "Ben-na-Bord." This is probably M'Nab's habitat. This seems to be the first separate Scotch record under the name, but still mixed with *S. decipiens*.

Babington in all the editions of the Manual, 1843 to 1904, has this mixture, adding in his first "Westmoreland, Dickson!" So it would seem that the first actual record for the true plant is by Watson ("Cyb. Brit." i. 1847, 417), made on the strength of Dr. M. Barry's Ben Avon examples; authenticated by Dr. B. Syme in "Eng. Bot." 3rd ed. iv. (1865), p. 79, where the plant is well described.

SOME REMARKS ON *EUPHRASIA* AND *RHINANTHUS*

By REV. E. S. MARSHALL, M.A., F.L.S.

MR. DRUCE and Mr. Beeby call attention (pp. 101-2, 106) to Dr. Ostenfeld's having combined *Euphrasia scottica* (Prof. Wettstein so spelt it, and Mr. Townsend arbitrarily altered the spelling), of which *E. paludosa*, Towns. (non Br.), is a synonym, and *E. foulaensis* with *E. minima*. As I know *E. scottica* and *E. foulaensis* pretty well, and am not at all disposed to consider them as belonging to one segregate, I venture to briefly give some reasons for keeping them apart. Well-developed specimens, according to my experience, are always quite readily separable at a glance; stunted plants may be more difficult. Unfortunately, I have but a very slight acquaintance with *E. minima*, though I collected the typical yellow-flowered form of the Swiss Alps many years ago. But *E. scottica* normally occurs in *wet* ground, especially on heaths, and is semi-parasitic on *Carices*; whereas *E. minima* chooses Grasses for its host-plants, and does not appear to show any special fondness for boggy places. Differences of colour, texture, etc., which strike the eye at once in living specimens, disappear when they are dried; and I believe that it is safer to follow Wettstein and Townsend in regarding *E. scottica* as distinct.

With respect to *E. foulaensis* I have no doubt. In Scot-

land it grows in two different habitats ; being found both near sea-level and on mountains, from about 2000 to 3700 feet (I collected it on Ben Lawers so long ago as 1887). With characteristic *E. scottica* it can hardly be confused, either fresh or dried ; being, as Wettstein says ("Mon." p. 140), nearest to *E. latifolia* ; from which it is distinguishable by its usually smaller size, fewer branches, much longer capsules, and by being far less hairy. It also approaches some coast-forms of *E. curta* in general appearance.

It is, however, probable that two distinct Scottish forms have been referred by Wettstein to *E. foulaensis*. Early in 1904 Mr. Townsend sent me specimens and detailed drawings of an Eyebright from Norway, which he intended to publish and figure as *E. minutiflora*, n. sp. These at once struck me as being practically identical with plants gathered abundantly in 1897 by Mr. Shoolbred and myself on heathy banks near Melvich, W. Sutherland, which had always seemed to me considerably different from the other specimens named *E. foulaensis* by Wettstein ; and, on receiving my three herbarium sheets of this, Mr. Townsend agreed that they were his proposed species. Soon afterwards his health began to fail ; and both his drawings and types and my own specimens have unaccountably disappeared. Among his botanical correspondence subsequently sent to me, I found my letters dealing with this subject. The main distinction from *E. foulaensis* seems to lie in the flowers, which are somewhat smaller, with the tube nearly or quite included in the calyx, and of a beautiful violet-blue, as in *E. Vigursii* ; I think that it is also a taller, more branched, and somewhat narrower-leaved plant than the ordinary coast-form of *E. foulaensis*, but have no precise recollection and no further examples. It is sure to occur in other localities in northern Scotland.

Rhinanthus stenophyllus is considered by Mr. Beeby to be an "autumnal" variety of *R. minor*. In England it does, upon the whole, bloom some weeks later ; yet I have specimens from Warminster, S. Wilts (so named by Dr. von Sterneck), gathered in flower and young fruit on 10th June 1903 ; and in N. Scotland (W. Sutherland, E. Ross), it begins to blossom quite early in July—little, if at all, later than *R. minor*.

According to Sterneck's monograph of *Alectorolophus*, Chabert published his names *R. Perrieri* and *R. minor* β *rusticulus* simultaneously ("Bull. de l'Herb Boiss." 512, 1899). I think that Mr. Druce's contention is quite arbitrary, and that the original specific name under this genus holds good; though Sterneck, under *Alectorolophus*, was free to choose.

WEST MONKTON RECTORY, TAUNTON.

17th May 1909.

ADDITIONS AND CORRECTIONS TO THE TOPOGRAPHICAL BOTANY OF SCOTLAND.

By JAMES W. H. TRAIL, A.M., M.D., F.R.S., F.L.S.

(Continued from p. 48, No. 65, January 1908.)

ERICACEÆ.

Pyrola media, Sw., 102.

PLUMBAGINACEÆ.

Armeria maritima, Willd., var. *planifolia*, Syme, 112.

POLEMONIACEÆ.

Gilia capitata, Sims, 83 cas.

BORAGINACEÆ.

Amsinckia angustifolia, Lehm, 83 cas.

Echinosperrum minimum, Lehm, 83 cas.

Symphytum orientale, L., 83 cas.

Anchusa undulata, L., 80 cas.

Alkanna lutea, A. DC., 83 cas.

Nonnea alba, DC., 83 cas.

Mysostis palustris, With., var. *strigulosa*, Mert. and Koch, 94.

Echium violaceum, L., 83 cas.

CONVOLVULACEÆ.

Convolvulus althæoides, L., 83 cas.

SOLANACEÆ.

Physalis Alkekengi, L., 83 casual, as seedlings.

SCROPHULARIACEÆ.

Mimulus Langsdorffii, Donn., var. *guttatus*, DC., 83.

Veronica acinacifolia, L., and *V. triphyllos*, L., casuals in 83.

Euphrasia curta, *Fr.*, 112.
Rhinanthus grœnlandicus, *Chabert*, 112.
R. Drummond-Hayi, *F. B. White*, 112.

LABIATÆ.

Salvia viridis, *L.*, 83 cas.
Ajuga pyramidalis, *L.*, 102. *A. Chamæpitys*, *Schreber*, 83 cas.
Lallemantia iberica, *Fisch. and Mey.*, 83 cas.
Sideritis montana, *L.*, 92 cas.

PLANTAGINACEÆ.

Plantago lanceolata, *L.*, var. *depressa*, *Rostr.*, 112. *P. albicans*, *L.*, 83 cas.

AMARANTHACEÆ.

Amaranthus Blitum, *L.*, and *A. spinosus*, *L.*, casuals in 83.

CHENOPODIACEÆ.

Chenopodium opulifolium, *Schrad.*, 83 cas.
Atriplex tatarica, *L.*, 83 cas.
A. laciniata, *L.*, 112.

POLYGONACEÆ.

Rumex pulcher, *L.*, 92 cas.

EUPHORBIACEÆ.

Euphorbia falcata, *L.*, and *E. taurinensis*, *All.*, casuals in 83.
Ricinus communis, *L.*, 83 cas., as seedlings.

URTICACEÆ.

Humulus Lupulus, *L.*, 84.

CUPULIFERÆ.

Betula verrucosa, *Ehrh.*, and *B. pubescens*, *Ehrh.*, both in 81.
 "B. alba, *L.*," *Alnus glutinosa*, *L.*, and *Corylus Avellana*, *L.*, are all recorded as existing native plants in Shetland within last century, on evidence regarded by Mr. W. H. Beeby as sufficient.
Quercus Robur, *L.*, vars. *pendunculata*, *Ehrh.*, and *sessiliflora* (*Salisb.*), both in 81.

SALICACEÆ.

Salix Caprea, *L.*, 112.
S. Caprea × *phylicifolia* (*laurina*, *Sm.*), 94.
Populus alba, *L.*, 81.

MONOCOTYLEDONS.

ORCHIDACEÆ.

Listera cordata, *R. Br.*, 78.
Epipactis palustris, *Crantz*, 102.

LILIACEÆ.

Polygonatum multiflorum, *All.* For 85 read 84.

Allium oleraceum, *L.*, 84.

PALMÆ.

Phoenix dactylifera, *L.* Seedlings sometimes spring up on rubbish near towns, *e.g.* in 83 and 92; but they do not survive a winter.

TYPHACEÆ.

Typha angustifolia, *L.*, 81†.

Sparganium ramosum, *Huds.*, *var. microcarpum*, *Neum.*, 102.

ARACEÆ.

Acorus Calamus, *L.*, 84.

ALISMACEÆ.

Butomus umbellatus, *L.*, 109 (†?).

NAIADACEÆ.

Potamogeton polygonifolius, *Pour.*, *var. cancellatus*, *Fryer*, 112.

P. alpinus, *Balb.*, *var. lacustris*, *Marss.*, 90 (Lunan Burn).

P. heterophyllus, *Schreb.*, 97; *var. intermedius*, *Tisel.*, 111.

P. nitens, *Web.*, *var. maximus*, *Ar. Benn.*, 89, 103.

P. lucens, *L.*, 73.

P. upsaliensis, *Tisel.*, 87.

P. polygonifolius × *prælongus* (× *Macvicarii*, *Ar. Benn.*), 97.

P. crispus × *perfoliatus* (× *Cooperi*, *Fryer*, 86).

P. crispus × *prælongus* (× *undulatus*, *Wolfg.*), 86.

P. obtusifolius, *Mert. and Koch*, 74, 98.

P. pusillus, *L.*, *var. acuminatus*, *Ar. Benn.*, 86.

P. vaginatus, *Turcz.*, 112.

P. filiformis, *Nolte*, 98.

(*To be continued.*)

ZOOLOGICAL NOTES.

Bird Migration: a new Scottish Enquiry.—An enquiry into the migration of birds is being inaugurated by the Natural History Department of the Aberdeen University, under the direction of our friend Professor J. Arthur Thompson. Following the plan which has been carried out with some success on the Continent, it is proposed to "ring" the legs of as many migratory birds as possible in the hope of obtaining information as to where our British summer visitors pass the winter, and as to the routes followed by them to reach their cold weather retreats. It is equally desirable that we should know where our winter visitors pass the summer. If such information can be

obtained a most important advance will undoubtedly have been made in our knowledge. We hope that Scottish naturalists will lend their hearty co-operation. Rings and full instructions may be obtained on application to Professor Thompson, The University, Aberdeen.

Hawfinch in Fife.—On the 21st of April while walking down the avenue here, I saw a bird that was absolutely new to me, and returned to the house for my Zeiss glass. Aided by this, I had a long look at him as he sat on the same tree with a Greenfinch and a Starling. He was nearly as big as the latter, and I could make out the conspicuous white shoulder-band, and the bill which took up nearly the whole front of the head. When it flew away, it showed some white about the rump. I have no hesitation in recording the occurrence of the Hawfinch at Tayfield.—WM. BERRY, Newport, Fife.

Nesting of the Hawfinch (*Coccothraustes vulgaris*) in East Lothian.—On 9th May last (1909) a Hawfinch's nest, containing five eggs, was discovered in a wood near East Linton (further indication of the locality I am not at liberty to give). It was placed in a holly at about ten feet from the ground where two branches left the main stem. Outwardly it was made of twigs of honeysuckle intermixed with grey lichen (*Ramelina*), the inside being neatly lined with fine rootlets. Unfortunately, from some unknown cause—perhaps a visit from a squirrel—two of the eggs had holes in them when the nest was shown to me by the discoverer some days later, and neither of the birds was then seen, though I heard one of them calling in the vicinity. On 23rd May a second nest, doubtless made by the same pair of birds, was found about 60 yards from the site of the first one. It was also in a holly at about the same height, and was composed of similar materials. Disaster, I am sorry to say, overtook this nest likewise, for when I visited it about a fortnight later in the hope of seeing young birds, it was found empty, with only the remains of an egg adhering to its edge.

Though young Hawfinches have on several occasions, beginning with Mr. Eagle Clarke's record in this magazine for October 1894, been captured near Edinburgh, this is, so far as the records show, the first time the nest and eggs have been found in the Forth area. From the Tay area Mr. W. Berry has recorded ("Annals," 1904, p. 11) a nest in north-east Fife.—WILLIAM EVANS, Edinburgh.

Bramblings in Solway.—After the end of December in any season the Cock o' the North, by which title the Bramble Finch is known throughout Solway, occurs so fitfully and seldom that the appearance of a considerable flock of these birds on 1st March is an incident worth recording. On this date a bare, frost-hardened, wind-swept stubble field that I happened to pass on the outskirts of the town held a very restless assemblage of Bramblings, Greenfinches, some Chaffinches, and a few Yellow Hammers. I estimated

the number of Bramblings as at least 800 to 900—a comparatively small flock when we recollect the huge swarms of this bird that sometimes assemble here on a November day when beech nuts are plentiful. Spring visits of this species are scarce and most unusual. Next day we had a heavy general fall of deep snow. Were the Bramblings and their feathered companions flying in advance of the coming storm?—ROBERT SERVICE, Maxwelltown.

Golden Oriole in Renfrewshire.—A Golden Oriole (*Oriolus galbula*) was observed flying about in a garden in Renfrewshire during the first half of May. It was afterwards found dead and was sent to me. Mr. Kirk, of Glasgow, by whom the bird has been mounted, informs me that it is a young male.—W. HORTON, Glasgow.

Blackbird and Thrush laying together.—From time to time one finds irregularities in the nesting of our commoner birds, *e.g.* two females of one species deposit their eggs in the same nest, or the eggs of different species occur in the same nest.

As a rule the stranger is easily detected. One would usually account for its appearance by supposing that the parent, forced to lay away from its own nest, had temporarily occupied the first suitable one that offered. In support of this is the fact that eggs are often found laid at random under hedges or bushes or even in the open. I have seen eight eggs in a Rook's nest, Pheasant eggs among Partridges, Tufted Duck's with those of the Shoveller. Recently, 4th May, the gardener at "The Cottage," Nethercraigs, by Paisley, showed me on a piece of waste ground near the house a Blackbird's nest containing six eggs of which three were of the Song Thrush. The nest, finished the previous week, had been closely watched. The birds were observed to lay on alternate days, and fought for the privilege of sitting. On 4th May the female Blackbird occupied the nest. From later observation it appears that the quarrelling of the parent birds did not cease as incubation advanced. In these fights the female Thrush usually succeeded in driving off the female Blackbird, but of the males the Blackbird proved the stronger. When the eggs hatched, a battle royal occurred which left the Blackbirds in possession for the time. The end of this curious venture came one Sunday when the nest was harried by a band of mill workers. There were in it then five young birds; whether the sixth egg hatched or not I have been unable to ascertain.—JAMES WATERSTON, Edinburgh.

Yellow-browed Warbler in Dumfriesshire in Spring.—At Lockerbie on the 11th of April, I had the pleasure of watching one of these singularly interesting birds for fully half an hour, as it flitted along a hedge, occasionally making short flights in the air to catch some insect on the wing. I got within about four feet of the little creature while it was busily engaged searching for food, and was

able to identify it beyond doubt. I was first attracted by the bird's peculiar note, with which I am quite familiar from my Fair Isle experiences which extend over several autumns.—GEORGE STOUT, Glasgow.

[We have no hesitation in accepting this record, for Mr. Stout is, to our knowledge, quite familiar with this bird. The record is of great interest as being the first known instance of the occurrence of *Phylloscopus superciliosus* in spring in the British Islands and for the mainland of Scotland.—EDS.]

Early appearance of the Swift.—Is the Swift inclining to spend a longer time with us? In my ornithological notes, dating back to 1881, I find the Swift usually makes its departure some time in August and returns in the second week of May; but here are my records for the last few years, made at Duddingston:—

Swift first seen, 18.5.03	last seen, 10.9.03
„ 12.5.04	„ 13.9.04
„ 7.5.05	„ 15.9.05
„ 2.5.06	„ 2.9.06
„ ...	„ 7.9.07
„ 3.5.08	„ 17.9.08
„ 28.4.09	„ ...

I have never noted the first appearance of the Swift in April till this year. April 28th was a cold day with occasional showers of sleety hail; the day following was also cold, when I again noted Swifts careering round the Manse.—WILLIAM SERLE, Duddingston.

Hoopoe in Skye.—In the *Scotsman* Mr. A. R. Macdonald records the occurrence of a Hoopoe (*Upupa epops*) at Waternish on the 27th of April. There appears to be only one previous record for the Island, namely that in *The Field* (27th Nov. 1880) of one in October in the Sconser Deer Forest.

Little Bittern in Orkney.—According to the *Orkney Herald* for 19th May, Mr. Cowan, Tankerness House, received a Little Bittern (*Ardetta minuta*) from Binscarth, where it was caught alive. It died soon after capture and was forwarded to Edinburgh for preservation, and is an adult male. It is said to be the second known occurrence of this species in Orkney. The only other example was shot as long ago as 1806, in the Island of Sanday.

Solway "Gray Geese."—We have had quite a remarkable number of Wild Geese on the green grassy shores and fields of the Firth margins. Barnacles were, of course, in their usual numbers, but it is of the Gray Geese I wish to make a note. For several years past the Bean Geese and the Pink Foot Geese have been fairly numerous, and the prevailing species. Since the end of September, however, when the Gray Geese began to come in, the Gray Lags have been the dominant species and very numerous

indeed they were at times. I have not seen or handled a single example of the Bean or Pink Foot, although I have reports of such. But so few sportsmen or gunners have distinguished betwixt the various species, that an identification, except on authority, should be received with scepticism. Practically no impression was made on the numbers of Geese present by the many gunners who made trial of their powers of stalking. But the birds became extremely timid and wary. A well-known gunner wrote to the local newspapers on the approach of close time to protest against the "absurdity" of protecting these preternaturally wary fowl as they—the birds—could do it so effectively themselves! Our long green meres and interminable flats afford no cover, and the peculiar atmosphere that hangs over the Solway on winter days seems actually to magnify the form and render more visible the crawling, crouching body of the would-be shooter.—ROBERT SERVICE, Maxwelltown.

Marked Pintail.—I have been handed a ring taken from the leg of a female Pintail shot by a gunner friend near Carsethorn, at the estuary of the Nith, about the 17th of February. The ring is a plain roughly-cut band of soft zinc which clasps by means of catch and notch, and is stamped "1908." Pintails have been rather frequent in the Solway waters this winter, the first being reported from Baldoon Sands in Wigtownshire on 9th October, and the last from Southernness on 28th February. No others with rings were reported.—ROBERT SERVICE, Maxwelltown.

Nesting of the Gadwall in Scotland.—Early in June of this year two nests of the Gadwall (*Anas streperus*) were found on a loch in the S.E. of Scotland. They were placed among rushes about 50 yards away from the water's edge, and contained 5 and 7 eggs respectively. The Duck was seen going off the nest, and specimens of the eggs and down were sent to Mr. Eagle Clarke who confirmed the identification. The down contained several unmistakable breast feathers of the female Gadwall. This is the second authenticated case of the Gadwall nesting in Scotland. It is to be hoped that many more instances of the nesting of this interesting Duck may be recorded in the near future.—LEONORA JEFFREY RINTOUL and EVELYN V. BAXTER.

Long-tailed Ducks in Orkney in Summer.—During the whole of the summer of 1905 a pair of Long-tailed Ducks (*Harelda glacialis*), male and female, remained on the Loch of Stenness, Orkney; another pair were there in July and August 1906, and hardly a summer passes but one or two pairs remain behind. Probably they are pricked birds unable to make their migration journey owing to their injuries, and one at least of these has even been in its winter plumage then, without doubt owing to this cause. It is very unlikely that such birds would nest there owing to their condition. They leave Orkney about the middle of April as a rule, and have then

lost almost all their winter plumage. A male and female which I shot on 6th April were very dark in colour; but a male sent to a friend of mine much later, shot on 12th May 1908, was not nearly as dark, although birds shot on 25th and 29th April that year were even darker than my specimens. During that spring (1908) they were very late in departing owing chiefly to adverse winds, and there were a fair number on the sea as late as 12th May and for several days after that date.—H. W. ROBINSON, Lancaster.

Little Crake in Ayrshire.—On the 29th of March a fisherman saw a bird moving about in his boat, which was lying in Girvan Harbour. On stepping into the boat he found that the bird could not fly, being in an exhausted condition, and he picked it up and brought it to me. I gave it water, slugs, chopped worms, and scraped beef, and left it for a few hours. On my return I found it had fed freely, principally on scraped beef, and was quite lively. On examining it carefully, with the aid of a friend interested in natural history, we came to the conclusion that it was a Little Crake (*Porzana parva*), an identification which was afterwards confirmed by Mr. Charles Kirk, taxidermist, Glasgow.—JAMES AIRD, Girvan.

Green Sandpiper in Solway.—A good specimen of this species was shot on the banks of the Ae, parish of Kirkmichael, Dumfriesshire, and brought to me for identification on 20th January. Of late years this species has put in so few appearances that this one is worth a record.—ROBERT SERVICE, Maxwelltown.

Great Crested Grebe at Duddingston Loch, Edinburgh.—For the first time since I came here six years ago I have detected the Great Crested Grebe on Duddingston Loch yesterday, 14.3.09. I was scanning a flock of Pochards and Tufted Ducks that were sunning themselves on the water below the Manse, when my binoculars rested on a fine specimen of this Grebe busily preening its feathers. I was within fifty yards of it, so did not go nearer to disturb it. I did not catch a sight of it this morning, but it may easily be at the far end of the loch.—WILLIAM SERLE, Duddingston.

The Red-necked Grebe in Orkney.—As the Red-necked Grebe (*Podiceps griseigena*) is said to be rare in Orkney, perhaps the following notes may be of interest. On 2nd March 1904 I saw several on the Loch of Harry, all but one being in full winter plumage as far as I could see, the exception showing himself, through my glasses, to be just commencing to change into his summer plumage. So rough was it on the loch and so wild were the birds that I was unable to get within shot of them. They were all single birds with the exception of two, which appeared to be paired. On 28th February 1905 I again saw a pair on this same loch in winter plumage, and again failed to get nearer than 150 yards. I fully believe, from what my boatman told me, that they are there every

winter. He knew the Slavonian, Great Crested, and Little Grebes, and wondered as to the identity of these birds, seeing that they were too large for Slavonian yet not large enough for Great Crested. Neither he nor I have ever seen them on any of the other lochs, but on 10th April 1908 I saw a single bird of this species on the sea in the Bay of Ireland.—H. W. ROBINSON, Lancaster.

Munida bamffia (*Penn.*) in the Firth of Forth.—The long-armed *Munida* seems to be rare in the Firth of Forth, or at any rate seldom obtained (*cf.* Dr. Scott's "Catalogue of Forth Crustacea"). It may, therefore, be worth while to record the following recent occurrences. Early in 1908 I examined one which had been taken in a crab-creel off North Berwick, and I have a fine specimen that was captured by the same means in the vicinity of the Bass on 14th January 1909.—WILLIAM EVANS, Edinburgh.

[Two Firth of Forth specimens of *Munida bamffia* occur in the collections of the Royal Scottish Museum. Regarding one, no more exact locality than "Firth of Forth" is given; but the other was obtained on the beach at Gullane on 1st November 1904.—EDS.]

Nemotelus uliginosus, *L.*, in Forth.—Besides the well-known locality for this fly near Aberlady, repeated in Messrs. Carter and Waterston's paper in the "Annals" for April last, I have taken the species at Charlestown in the West of Fife; both sexes, 16th July 1904.—WILLIAM EVANS, Edinburgh.

BOTANICAL NOTES AND NEWS.

The Floras of the Faröes and Iceland compared with that of Scotland.—To Mr. Arthur Bennett's interesting note "Plants of the Faroe Isles not occurring in Great Britain," etc. in the January number of the "Annals," I should like to add some few remarks.

Mr. Bennett gives 8 species which occur in the Faröes, but not in Great Britain. He quotes them from my papers on the Flora of the Faröes, with "Additions and Corrections," etc. 1907, and "the Land-Vegetation of the Faröes," 1908; but if he had consulted my principal list, viz. "The Phanerogamæ and Pteridophyta of the Faröes," 1901, he would have found that the *Draba hirta* given by him as one of the eight species, is *D. hirta*, f. *rupestris* (R. Br.), the same plant as *D. rupestris*, R. Br., of the British Floras (Babington, "Manual," 9 ed. p. 34). There are, then, only 7 Faröese species absent from great Britain. Among them is *Epilobium lactiflorum*, Haussku, which I suspect will be found in the Scottish mountains.

Mr. Bennett's list of Faröese species absent in one or more of the vice-counties—Shetland, Orkney, Caithness, Outer Hebrides—contains also records for Iceland, and with regard to the occurrence or

not in this last country there are some few mistakes: *Montia lamprosperma* is common in Iceland and the only species there of the genus; also *Polystichum lonchitis* is common in Iceland. As to the *Alectorolophus* (*Rhinanthus*) species Mr. Bennett gives *R. grænlandicus*, *R. pubescens*, and *R. fallax* as occurring in the Faröes—but of these three forms I have only *A. grænlandicus*, which I record also from Iceland (1901, p. 55); *A. minor* occurs also in both countries. The comparison by Mr. Bennett of the altitudes of the plants in the Faröes and in Scotland would have been much extended if he had used my paper from 1901, in which many records of altitude are given. Among the 17 species used for comparing the altitudes more than half the number are rare plants in the Faröes: five are found only in one or two places. It would have been much better to have taken the common species of arctic (alpine) origin for comparison. As to *Saxifraga nivalis* Mr. Bennett quotes: "Subalpine latitude, *i.e.* lower regions, and exceptionally on the mountain-plateaux," but this must be a misreading. I have (1908, p. 901) "Alp. lat." (*i.e.* "alpinus, sensu latiore"), and that means (see p. 896) "species found on the mountain plateaux, and also exceptionally in the lower regions."—C. H. OSTENFELD, Copenhagen.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—April-June 1909.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

WILD CATS IN INVERNESS-SHIRE. A. R., *The Field*, May 15, 1909, p. 244. Refers to a specimen about six months old, trapped at Struy, and a full-grown female trapped at Glendee.

ANTLERS OF SCOTTISH RED DEER. A. R., *The Field*, June 19, 1909, p. 1075. Account (with photograph) of a horn $42\frac{1}{4}$ inches long from the Monar Forest, Ross-shire.

NOTES ON THE BIRDS OF WEST RENFREWSHIRE (Caldwell District), 1908. T. Thornton Mackeith, *The Zoologist*, June 1908, pp. 228-231.

NOTES FROM MILLPORT MARINE BIOLOGICAL STATION. Richard Elmhirst, F.L.S., *The Zoologist*, June 1909, pp. 201-203. Deals with (1) the Whelk as Food of the Cod; and (2) Feeding Habits of the Conger-Eel and some other Fish in captivity.

PRELIMINARY NOTICE OF THE CEPHALOPODA COLLECTED BY THE FISHERY CRUISER "GOLDSEEKER," 1903-1908. By G. S. Russell, M.A., *Ann. and Mag. Nat. Hist.*, May 1909, pp. 446-455. Sixteen species are described, three of which are new to science, all obtained on the east and north coasts of Scotland, round the Shetlands, and between the Shetlands and the Faeroes.

SOME NOTES ON THE LEPIDOPTERA OF THE "DALE COLLECTION" OF BRITISH INSECTS, NOW IN THE OXFORD UNIVERSITY MUSEUM. James J. Walker, M.A., R.N., F.L.S., *Ent. Mo. Mag.*, May 1909, pp. 106-110. Notes on various Scottish specimens.

LIST OF LEPIDOPTERA CAPTURED RECENTLY IN "ROSS-SHIRE." Dorothy J. Jackson, *Ent. Record*, May 1909, pp. 115-117. Seventeen species of Rhopalocera and thirty-three of Heterocera are recorded in this instalment of the paper, which is to be continued.

OMALIUM FORAMINOSUM, MÄKLIN, IN SCOTLAND. D. Sharp, *Ent. Mo. Mag.*, June 1909, p. 135. Recorded for Rannoch and Thornhill.

ON THE BRITISH SPECIES OF PHORA (Part II.). John H. Wood, *Ent. Mo. Mag.*, June, 1909, pp. 143-144. *Phora obscuripennis* and *beckeri* recorded as Scottish.

NOTES ON THE BRITISH DRAGONFLIES OF THE "DALE COLLECTION" (II.). W. J. Lucas, B.A., F.E.S., *Ent. Mo. Mag.*, April 1909, pp. 79-83. *Agriion hastulatum* referred to as having been taken in Sutherland in 1842 by Richard Weaver.

RAPHIDIA MACULICOLLIS. W. J. Lucas, B.A., F.E.S., *Entomologist*, June 1909, pp. 129-130. A Nethy Bridge specimen referred to.

STUDIES ON THE STRUCTURE AND CLASSIFICATION OF THE DIGENETIC TREMATODES. By William Nicoll, M.A., D.Sc., *Quart. Journ. Micro. Sci.* vol. 53, pt. 3, May 1909, pp. 391-487, pls. 9 and 10. The material worked out in this lengthy paper is of Scottish origin.

BOTANY.

A NEW HYBRID SAXIFRAGE FROM SCOTLAND. By Rev. E. S. Marshall (*Journ. Bot.* 1909, pp. 98-99). *S. nivalis* × *stellaris* (*S. Crawfordii*, n. hybr.), gathered by F. C. Crawford on 7th August 1902, in Corrie Sneachda, Cairngorm.

NOTES ON CAREX CANESCENS, LIGHTF. By Rev. E. S. Marshall (*Journ. Bot.* 1909, pp. 107-108). Var. *tenuis*, Lang, from Clova and Glen Callater; var. *fallax*, Asch and Graelm in Mid-Perth, E. Perth, Forfar, W. Inverness, E. Ross; *C. canescens* × *echinata*, probably is the plant reported as *C. helvola* by Mr. Druce from Ben Lawers.

ENCALYPTA CILIATA, VAR. SUB-CILIATA, WARNST. By H. N. Dixon (*Journ. Bot.* 1909, p. 109), gathered by G. Stabler in Aberdeenshire "in the eighties."

HIERACIUM SILVATICUM, GOUAN, VAR. TRICOLOR, W. R. LINTON, IN BANFFSHIRE. By Ed. S. Marshall (*Journ. Bot.* 1909, p. 110), from limestone rocks near Tomintoul.

OBITUARY OF SIR GEORGE KING, F.R.S., with portrait (*Journ. Bot.* 1909, pp. 120-122).

OBITUARY OF ALEXANDER WHYTE, F.L.S. (*Journ. Bot.* 1909, p. 155).

EUPHRASIA MINIMA. By W. P. Hiern (*Journ. Bot.* 1909, pp. 165-172), found in England on Exmoor as a yellow-flowered plant. The relations between *E. minima*, *E. scottica*, and *E. foulaensis* are not discussed.

NOTES ON THE TRAP-FLORA OF RENFREWSHIRE. By G. F. Scott-Elliott (*Ann. of Andersonian Nat. Soc.* iii. Glasgow, 1907). The trap is porphyritic of O.R.S. age. Sequence of vegetation is:—(1) Lichen stage, crustaceous (*Lecidea*, *Lecanora*, etc.), and foliaceous (*Parmelia*, *Cladonia*, etc.). (2) Moss stage, *Rhacomitrium*, etc., and lichens, in tufts, forming a soil and protecting the rock. (3) *Vaccinium* stage, the soil is tenanted by *Vaccinium*, *Calluna*, heath grasses, etc., living in crannies or in the humus. In wet situations sphagnum accumulates, and *Eriophorum*, *Scirpus cespitosus*, etc., occupy the surface. In dry situations (3) is followed by (4) Herbaceous stage, on disintegrating rock with rapid drainage, with *Scabiosa*, *Thymus*, *Campanula rotundifolia*, *Teucrium*, *Viola*, etc. (5) *Ulex* stage, *Ulex*, *Cytisus*, *Pteris*, etc., dominant. (6) Rosaceous stage, shrubby and arboreal Rosaceæ replace *Ulex*, etc. This stage is followed by trees of oak, etc.

LE PLANCTON DES LACS ÉCOSSAIS. By H. Bachmann (*Arch. des sc. phys. et nat. Genève*, xx. 1906, pp. 359-361). Relates to nine lochs, of which (except Loch Leven) the plankton was examined living. Always present were *Cryptomonas*, *Mallomonas*, and *Chlamydomonas*, all very frequent in the Swiss lakes also. The organisms dominant in the Scotch lochs were:—Leven, *Asterionella gracillima*; Earn, *Clathrocystis*, sp.; Lochy, *Tabellaria fenestrata*, var. *asterionelloides*; Oich, *Ceratium hirundinella*; Ness, *Asterionella gracillima*; Uanagan, *Uroglena volvox*; Morar, *Staurastrum*; Lomond, *Clathrocystis*, sp. The lochs that communicate with one another retain their characteristics, as do the Swiss. The author notes the numerous Epiphytes in the plankton and the constant presence of two species of Bacteria on the colonies of *Clathrocystis*.



BOOK NOTICES.

A NATURALIST IN TASMANIA. By Geoffrey Smith, M.A. (Oxford: The Clarendon Press, 1908.) Price 7s. 6d. net.

As the result of a six months' residence in Tasmania during the spring and summer of 1907-8, Mr. Smith has produced an interesting little volume dealing with the animal and plant life which came under his notice. The main object of his visit was to make a special study of the fauna of the freshwater lakes of the island—an important piece of biological investigation,—and a large section of his book is devoted to describing the results of his researches, a number of his discoveries among the crustaceans being figured. The author proves himself to have been an enthusiastic all-round observer, and he discusses engagingly on animal life generally; the egg-laying mammals Platypus and Echidna coming in for special notice, as do also Parrots and other birds. Graphic descriptions are given of the scenery and vegetation, mention being made of the more interesting plants met with. In the introductory chapter the author writes on the lost Tasmanian aborigines, their character, and the causes of their extinction, etc.; and discusses the vexed question of their origin. In his final chapter he treats of geographical distribution of animals and plants, with special reference to the survival of the ancient types to be found in Tasmania and Australia. The book affords a most interesting and welcome sketch of the natural history of a remote but important part of our empire, as well as contributing materially to our knowledge of its freshwater fauna. It is well illustrated by plates reproduced from a series of excellent photographs, and forms an attractive volume. G. G.-M.

DIE TERMITEN ODER WEISSEN AMEISEN: EINE BIOLOGISCHE STUDIE. By K. Escherich. (Leipzig: Dr. Werner Klinkhardt, 1909.) Price (sewn) 6 marks or (bound) 7 marks.

It is impossible, in the space at our disposal, to do proper justice to this well-written and beautifully illustrated account of the White Ants or Termites. But we can cordially recommend it as worthy of perusal. Written in an easy style of German and by an acknowledged authority on the subject, it cannot fail to interest the lover of Insects, especially when regard is had to the remarkable social and building habits possessed by these creatures. The first chapter gives a sketch of the various personalities found in a Termite colony, and this is followed by accounts of their reproduction, nest-building, feeding habits, the relations of White Ants to other members of the animal kingdom (including man himself), and other fascinating subjects. A very useful systematic summary of Termites is given in the form of an appendix, while an additional section concludes the volume with short supplementary paragraphs on various topics, with

an excellent bibliography and index of authors. The work is embellished by a beautiful drawing, reproduced by the three-colour process, of the royal cell of *Termes bellicosus*, showing the queen surrounded by her progeny and guarded by her soldiers.

INTERNATIONALE REVUE DER GESAMTEN HYDROBIOLOGIE UND HYDROGRAPHIE. Edited by R. Woltreck. (Leipzig: Dr. Werner Klinkhardt.) Subscription, 30 marks per annum.

By the publication of this periodical another is added to the long list of magazines which have for their object the furtherance of Natural Science, and, in spite of the difficulties to which the ever-increasing complexity of biological literature gives rise, the addition is to be welcomed on account of its endeavour to unify our disjunct knowledge of the physics and biology of the waters. The periodical, which appears in two-monthly parts, is to be devoted to the publication of articles dealing with the investigation of the physical characters and biological content of waters salt and fresh, of the great oceans, of seas and of ponds, of rivers and of springs. But the goal that is kept in view throughout, is less the furtherance of any of the many separate branches of science with which such a study is concerned, than the welding of those loose links into a solid chain—the comprehensive science of Hydrobiology and Hydrography.

Among the original contributions to the first volume may be mentioned "A Hydrobiological Introduction," by Professor August Weismann, and a paper on "The Distribution of Organisms in the Hydrosphere as affected by varying Chemical and Physical Conditions," by Sir John Murray. Besides that devoted to original contributions the volume contains two other exceedingly valuable sections: the first made up of short articles dealing with the results of recent hydrobiological investigations—and here the work of the Scottish Lake Survey bulks largely; the other bringing together the latest information available, by means of summaries of researches published in contemporary journals. The volume is illustrated by numerous plates—one of them containing beautifully coloured representations of *Daphnia*—and many text-figures.

INSECT STORIES. By Vernon L. Kellogg. London, George Bell & Sons, 1908. Price 5s.

The author of this entertaining little volume is a well-known authority on Insects, and the writer of an important text-book on the subject. Consequently anything he writes, even if adorned with picturesque phraseology, and adapted for very youthful readers, may be regarded as thoroughly reliable. There are thirteen of these "Insect Stories," which is an unlucky number for the reader—who will wish for more! The stories cover a large field and are pleasantly told, and the volume forms a charming gift-book for

boys or girls who show a leaning towards the pursuit of nature-knowledge.

A TREATISE ON ZOOLOGY. Edited by Sir Ray Lankester, K.C.B., F.R.S. Part VII. Appendiculata. Third Fascicle: Crustacea. By W. T. Calman, D.Sc. Pp. viii. and 346. (London: A. and C. Black, 1909.) Price 15s. net.

The value to the general student of the accounts of the Crustacea which have appeared almost simultaneously in three English textbooks, can scarcely be overestimated, for the need of an English treatise dealing with this important class has long been acutely felt. That the present volume has been written by so well-known an authority as Dr. Calman is a guarantee of thoroughness, and the thoroughness is especially noticeable in his accounts of structure and development, although enough is said regarding its definition, zoological history, habits, palæontology, and affinities, to render the account of each group remarkably complete.

Several changes from the classification adopted in most other treatises are noticeable: chief of these being the suppression of the comprehensive sub-class Entomostraca in favour of many sub-classes, which, on account of their heterogeneity and negative characters as a whole, cannot form a unity in a natural system.

Throughout the volume are scattered facts of the greatest interest to the general reader. Thus in the pages discussing the morphology of the Decapoda we find striking examples of convergence: as, for example, where a long eyestalk is due to the lengthening now of the first segment (*Podophthalmus*), now of the second (*Macrophthalmus*); or again, where similar respiratory siphons are developed in different families, at one time from the antennules (*Albunea*), at another from their flagella (*Solenocera*), or again from the flagella of the antennæ (*Corystes*). We learn that the truly terrestrial Decapods, such as the Cocoa-nut Crab (*Birgus*), have been derived from marine, and not, as would seem most reasonable, from fresh-water types, and that, confirmed land-lubbers though they appear to be, they pass their early stages in the ocean. Interesting, too, are the references to "relict" faunas, otherwise marine genera being represented in the now fresh-water areas of N. Europe and America (*Mysis relicta* occurs in Ireland)—but we note that no mention of them is made in the index.

As in the whole series, binding and type are excellent, and the volume is illustrated by numerous figures mostly adopted from the original papers of recognised authorities. A valuable list embodying the most important works dealing with the group discussed is appended to each chapter.—J. R.



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[OCTOBER

REPORT ON SCOTTISH ORNITHOLOGY FOR 1908.

By JOHN PATERSON.

WHILE there is no lack of interest in the year to which this Report relates when regarded as a whole, there are some quite remarkable features about the second quarter, concerning which the first quarter gave no hint. The spring migration of species largely represented in Scotland throughout the year, such as the Lapwing and Curlew, began early, and March gave us, in its second half, such species as the Lesser Black-backed Gull, White Wagtail, Wheatear, and Sand-Martin, when we look for them in a normal year. With the advent of April there was a great change, and this month proved more barren of results than any that can be recalled by the present generation of Scottish Ornithologists. For a period of fully three weeks the stream of migration was arrested. The conditions that obtained in Scotland do not account for this extraordinary state of matters, as while the weather continued during this time very cold, it was dry and bright, very suitable for farming operations and encouraging to the ornithological observer. We have frequently had a good show of April visitors when the weather was little better. The cause must then be sought beyond our borders, and this is not hard to find. While

locally the conditions in respect of geniality may have left the fastidious something to desire, they were much worse in England, and appeared in that country to become exaggerated as the month progressed, culminating in the Easter snow-storm—the worst of which was experienced as late as 25th April—of which the curious will find full particulars in Symons's "Meteorological Magazine" (vol. xliii., No. 508, May 1908). The natural corollary of this state of affairs was the deficiency in the mean temperature over the whole of the United Kingdom, "the deficit being greatest (three to four degrees) over Eastern and Central England (*loc.*, p. 75)." How these conditions were reflected on the ornithology of England we have learned, partially at least, in Mr. W. Warde Fowler's note in the "Zoologist," May 1908 (p. 177), Mr. J. H. Gurney's "Ornithological Report for Norfolk (1908)" in the same Journal in April 1909, and the Rev. A. Ellison's 'Bird Life in a Spring Snowstorm' ("British Birds," vol. ii., 1908-9, p. 301). Through this zone, where such untoward conditions prevailed, our summer visitors could not penetrate, and there is evidence that such disaster had overtaken some of them, that they never reached the destinations in these latitudes for which they had set out. A deficiency in the numbers of the Swallow and House-Martin has been reported, though this is, rather curiously perhaps, unsupported, but the numbers of the Spotted Flycatcher were decidedly below the average, while complete disaster seems to have overtaken the Sedge-Warbler. Independent unsolicited testimony from all quarters places this last fact beyond doubt. Why this species should have suffered so signally we may never know, but possibly its appearance in England may have synchronised with the boreal outburst in the end of Easter week. We learn from Mr. Gurney's report above quoted that "the deficiency in Reed and Sedge Warblers was pointed out to Mr. Bird on the Broads."

For information regarding the paucity of summer visitors in April in Scotland, the reader must refer to the notes under Willow Wren, Swallow, etc., in the following pages, and the narratives under Spotted Flycatcher, Sedge-Warbler, etc., will be found to contain some curious matter regarding what obtained later in the year.

One outstanding feature of the spring migration was the unprecedented inrush and confusion of species which took place in the last day or two in April, and first day or two in May, when, as a result of a change of conditions, all those then due and those that had survived among the species overdue arrived together. A pointed illustration of the late inrush may be given. The dates available relating to the appearance of summer visitors in the "Clyde" area at least equal in amount those for the whole of Scotland. Taking "Clyde," then, as a unit, to illustrate the country generally, it is found that between 26th April and 4th May, a period of nine days, there were recorded in the year under review the first appearances of *eleven* species ("The Glasgow Naturalist," part iii., p. 71), in 1909 *two* species (*l.c.*, p. 73). It is due to Mr. D. Macdonald, who has sent admirable schedules for several years from Mull, to say, that he considers the spring migration to have been retarded and deflected, but the present writer has come to the conclusion that it was arrested and partially strangled in central and south-eastern England. The table showing the difference in the numbers of pairs of migrants observed in a small area at Tunbridge Wells in 1907 and 1908, with its remarkable deficiency in the latter year, if true of central and southern England as a whole, is perhaps significant of more than its authors have realised ("British Birds," vol. ii., 1908-9, p. 326).

The autumn emigration from the west coast at any rate was remarkably retarded, judging from the narrative given by Mr. Anderson from Tiree (p. 51), and Mr. Macdonald's notes. This is accounted for by the latter as being a result of a mild autumn, while the former attributes it to the continuance for six weeks of strong south-east winds, as the birds nearly all disappeared when the wind changed to the west (p. 51). The great annual immigration of the Redwing, which is the most impressive feature of our returns, took place on the 16th and 17th of October, wind S.S.E., and was observed at many stations from Sule Skerry to Cathcart (Renfrew). The autumn witnessed a great irruption of the Goldcrest, of which we have had no such striking illustration for years past. The observations run from 10th September till 9th November, and the period of intensity synchronised

with the great immigration of the Redwing, 17th-19th October.

Fair Isle reports for the year, it will be observed, are confined to the species new to the Island's fauna.

Cordial thanks are tendered to all contributors. Very many of the schedules received leave nothing to be desired. Information has been received from the following among others:—The Light-Keepers, Sule Skerry; John S. Tulloch, Lerwick; Annie C. Jackson, Swordale; Leonora Jeffrey Rintoul and Evelyn V. Baxter, Largo; William Berry, Tayfield; John Maccuish, Isle of May; Lewis Dunbar, Thurso; Thos. F. Dewar, M.D., D.Sc., Forfar; Wm. F. Little, Crosswood Reservoir, West Calder; William Evans, Edinburgh; S. E. Brock, Kirkliston; Robert Anderson, Flannan Islands; Robert Agnew, Monach; D. Macdonald, Tobermory; R. Clyne, Butt of Lewis; Robert Service, Dumfries; James Bartholomew, Beattock; T. Thornton MacKeith, Caldwell; John Craig, Beith; Dr. Niel Fullarton, Lamrash; Rev. J. D. W. Gibson, Carmichael; John Robertson, Robert, Hugh W., and Thomas Wilson, Alex. Ross, Robert Henderson, R. M. Buchanan, W. Rennie, Angus M'Leod, Glasgow; A. Shanks, Dalry.

TURDUS VISCIVORUS (Mistle-Thrush).—Pairing, Gilston (Fife), 6th February; appear in Mull (6) on 12th. First egg, Gilston, 10th April, and last in full song, Lee Castle (Lanark), 6th June. In passage, Swordale (E. Ross), 23rd August, 17th October; Isle of May, 23rd September, and 7th October; Mull, 4th till 21st October, feeding on rowans.

T. MUSICUS (Song-Thrush).—Movements at Isle of May, 21st to 26th March (p. 7). Laying begins, Scotsraig, 20th March. Young newly hatched, Kilchattan (Bute), 19th April. Last in song, 11th July, Kirkliston, and regains song there 8th September. On the Isle of May, 10th September till 28th October, in varying numbers (p. 7).

T. ILIACUS (Redwing).—Last mainland observations in spring, 11th and 12th April, Lochwinnoch and Giffnock (Renfrew) respectively, and Gilston (Fife) (20) on 16th. The most impressive feature of the ornithology of Scotland in this year is the narrative of the contributors to this report of the great immigration of the Redwing in October. The first mainland observation was on the 5th at Cathcart (Renfrew), followed

by Kirkliston, 6th, and Swordale, 15th, where on the following day the countryside was alive with them. "In one particular valley flock after flock kept arriving—they were accompanied by Bramblings." At the Butt of Lewis a large number was flying round the lantern at night on the 6th. On the 14th, at Lerwick, there was a big rush with fog. On the 16th and 17th, great numbers were seen at Sule Skerry, S.S.E. wind, haze; and at the Isle of May on the 16th also there was a great rush. On the 17th at Cathcart, judging from call notes, more passed over than on any other night during the season; very dark with light easterly wind. On the 18th they are reported at the Flannans in thousands, and at Monach in hundreds. A large body arrived in Mull on the 20th, remaining in considerable numbers throughout the winter till the 31st of March 1909. On the 23rd an enormous rush was observed on the Isle of May, and another from 7 P.M. on that day till daybreak the following morning. On the 29th there were again thousands observed at the Flannans.

- T. PILARIS (Fieldfare).—Small parties were observed at seven localities on the mainland and light-stations between the 2nd May at Bridge of Weir (Renfrew), and 9th at Beith (Ayr). The first observation in autumn is on 20th October in Mull. Thousands are reported at the Flannans on 5th November and Butt of Lewis on the 10th—these are the only important movements noted. Mr. Craig remarks that at Beith there were more Redwings than Fieldfares this year, and in West Sutherland they were not nearly so numerous as during the autumnal immigration in the preceding year (pp. 47-8), and these observations are borne out by the lighthouse returns. When boreal conditions set in, 29th and 31st December, considerable movements of the species were noted, at Lahill (Fife), Dunure (Ayr), and Mull.
- T. MERULA (Blackbird).—This species is reported in song between 6th February at Kirkliston, and 5th July, Mearns (Renfrew). One with a yellow head was seen at Gilston (Fife) on 27th February, and the first egg is reported from the same place on 27th March. At Beith two broods were raised in the same nest. It was singing again at Caldwell on 21st September. No great movement of this species has been reported for several years past.
- T. TORQUATUS (Ring-Ouzel).—Isle of May, 26th April; Arran, 27th; Mull, 28th; Kinnelhead (Beattock), 30th, all single birds or pairs. Latest in autumn, Isle of May on 28th October (3).

- SAXICOLA GENANTHE* (Wheatear).—Corkindale Law (Renfrew) and Levencorrach (Arran), 28th March; Isle of May, 1st April; Duddingston and Torduff (Pentlands), 6th. Markedly scarce in Mull as a nesting species this year, and Mr. William Rennie says he saw none on his frequent visits to Alloa and Bo'ness, where in former years he could always depend on seeing them in suitable places. There are decidedly more references than usual to the occurrences of this species in October, and in November it is reported on 1st and 3rd at Butt of Lewis, 2nd at Wick, while in Tiree it was still fairly numerous (p. 51) in the first week in November.
- PRATINCOLA RUBETRA* (Whinchat).—Kirkliston, 4th May; Isle of May, 5th (p. 8); Mull and Kinnelhead (Beattock) 6th; Beith, 9th (three pairs); Garnkirk (Lanark), 10th. Almost daily on Isle of May, 19th September till 4th October (p. 8). Latest seen on mainland, Kirkliston, 25th September.
- P. RUBICOLA* (Stonechat).—8th October, Isle of May, one (♂) (p. 8).
- RUTICILLA PHENICURUS* (Redstart).—Isle of May, 1st May (p. 9); Kinnelhead (Beattock), 2nd; Carmichael (Lanark) 3rd; swarming on the lantern in the Isle of May (p. 9) on 4th and 5th; Mull, 5th; Carmyle (Lanark), 7th. Autumn reports at light-houses, 23rd August (Isle of May) (p. 9) till 26th October (Butt of Lewis) (p. 48).
- R. TITYS* (Black Redstart).—22nd October, East Neuk o' Fife, one (♂) (p. 49); 6th November, South Uist (1) (pp. 4-5).
- CYANECULA SUECICA* (Arctic Bluethroat).—22nd September to 5th October, Isle of May, several (p. 9).
- ERITHACUS RUBECULA* (Redbreast).—27th April a great many at Isle of May, and numerous till 6th May (p. 9). In June at Scotsraig, Fife, a Robin constantly fed a young Blackbird, which had just left the nest. Last in song in summer on 30th June, it began its autumn song in Mull, 21st August. At the Isle of May in passage, 6th September till 3rd November (pp. 9-10). Huge numbers everywhere at Crail 17th-20th October.
- SYLVIA CINEREA* (Whitethroat).—Gilston (Fife) (2), and Kirkliston, 7th May. Rouken Glen (Glasgow) and Beith, 10th. Mull, 12th, one (♂). At Kilchattan (Bute) on 3rd June, a nest with young newly hatched. Last heard singing at Cathcart, "the usual farewell twitter," 2nd August. Last seen and in song (!) at Kirkliston on 4th September. Many more seen at Isle of May this autumn than last (p. 10). Reported from the Flannans (1) on 1st November, and Lerwick on 5th.

- S. CURRUCA (Lesser Whitethroat).—24th, 25th, 27th September, Isle of May, single birds.
- S. ATRICAPILLA (Blackcap).—Kinnelhead (Beattock), 2nd May; Rouken Glen (Glasgow), 10th, pair (♂ and ♀); Kirkliston, 14th, and young leave nest, 14th June. On ten dates in autumn between 20th September, Isle of May, and 26th October, Butt of Lewis.
- S. HORTENSIS (Garden Warbler).—Rouken Glen (Glasgow), 10th May (1); Kirkliston, 16th. Young leave nest at last named on 18th June. At various lighthouses 20th September (Isle of May), till 26th October (Monach).
- S. NISORIA (Barred Warbler).—Several in the autumn in the Fair Isle (p. 73).
- S. SUBALPINA (Subalpine Warbler).—The second British example taken on the Fair Isle in 1908 (p. 72).
- REGULUS CRISTATUS (Golden-crested Wren).—Building at Rouken Glen (Glasgow) on 11th April. An interesting immigration took place in the third week of October. Numerous on the Isle of May, 17th, several at the Butt of Lewis, and great numbers at Lerwick, on 18th, and from 19th to 21st at Crail and neighbourhood, great numbers. From September till December inclusive, reported from many localities in small numbers, the greatest movement being in October as noted in detail above. A number got by Mr. Evans from Barnsness and Isle of May lighthouses were of the British race ("Brit. Birds," ii. pp. 232-3.)
- PHYLLOSCOPUS SUPERCILIOSUS (Yellow-browed Warbler).—22nd, 24th, 25th September, and 3rd October, single birds on the Isle of May, all males (p. 11).
- P. RUFUS (Chiffchaff).—20th April, Dalry (Ayr); 27th, Lerwick; Found nesting at Tobermory, Mull, for first time in June. At Isle of May, Lerwick, and Monach Isle on 5th, 21st, and 27th October respectively, also 7th November, Outer Hebrides (p. 3).
- P. TRISTIS (Siberian Chiff-chaff).—At Kirkwall two noticed on 25th January, one secured early February ("Ann. Scot. Nat. Hist.," 1908, p. 80).
- P. BOREALIS (Eversmann's Willow-Warbler).—At Fair Isle on 28th September, one (♂) (pp. 1-2). New to the British fauna.
- P. TROCHILUS (Willow-Wren).—The April records are sufficiently extraordinary to justify insertion in detail:—Gilston (Fife) (1), 14th; Caldwell (1), 15th; Kirkliston, 23rd (1), and only another one in April there; Rouken Glen (Glasgow), 25th,

(1); Mearns (Renfrew) 26th (1); East Linton, 29th (1) (Evans); Dreghorn, 30th (1) (Evans); Isle of May, 30th (2), and numerous there next day (p. 11). Became generally reported, 1st to 3rd May. In Mull on 2nd May, one in sixteen miles, but general next morning. This record is eloquent regarding the conditions in the sister country which the Willow-Wrens had failed to penetrate. In song till 12th July, Mearns (Renfrew). Last mainland observation, 27th September, Caldwell, one among rasps. At Butt of Lewis on 26th October (p. 48).

P. *SIBILATRIX* (Wood-Wren).—A few seem to have penetrated to Dunoon by 20th April, but this is exceptional. Kirkliston, 8th May; Braidwood (Lanark), Row (Dumbarton), and Kilchattan (Bute), 9th; Darnley Glen (Glasgow), 10th; Mull, 11th, one (♂), and found later nesting at Lochbuie, Carsaig, and Duart (Mull).

HYPOLAIS ICTERINA (Icterine Warbler).—Got in the Fair Isle (p. 73). New to Scotland.

ACROCEPHALUS PHRAGMITIS (Sedge-Warbler).—Possil (Glasgow), 3rd May (1), but no more there till 14th. At Caldwell and Balgray (Renfrew) on 10th, Kirkliston, 11th. Very scarce at Possil Marsh, where the largest number seen by Mr. Wm. Rennie between 17th May and 14th July was five on 16th June. On 17th June Mr. MacKeith could only find two nests in two hours at Loch Libo: he says, "I think the special feature of the season is the great scarcity of the Sedge-Warbler." In Bute "much scarcer than usual, many situations which in former years harboured a pair or more were untenanted" (John Robertson). Mr. John Craig, writing to me from Beith, says on 4th June, "Strange to say, I have never seen or heard a Sedge-Warbler." In his "Notes" under date 6th July, Mr. Robert Service asks if his "observation that these birds, usually so conspicuous and vociferous, are this season extremely scarce, is confirmed by other observers of our local bird life." A very unambiguous reply is supplied in the foregoing details, which further illustrate the value of co-operation for the exercise of which this report supplies the opportunity. The first notice of its scarcity came from Kirkliston.

LOCUSTELLA NÆVIA (Grasshopper-Warbler).—At Dalry (Ayr), 9th May, Darnley Glen (Glasgow), 10th, and one (♀) on the Isle of May on 21st September.

L. *LUSCINIOIDES* (Savi's Warbler).—Occurred at the Fair Isle in the spring (p. 73). New to Scotland.

ACCENTOR MODULARIS (Hedge-Sparrow).—Sings, Mull, 3rd February. Young, at Gilston, when newly fledged, still had

spots on the spurs of the tongue. Last in song, Kirkliston, 30th July, and regains it there on 17th September. On seven occasions between 28th September and 8th October at the Isle of May.

- A. COLLARIS (Alpine Accentor).—One observed on the Fair Isle in the autumn (p. 73). New to Scotland.
- CINCLUS AQUATICUS (Dipper).—In Mull, 14th February, nest nearly complete. On 20th April young of first brood left nest, and on 27th June second brood left. General laying time 6th-19th April. One on the shore at Crail on 19th October.
- ACREDULA ROSEA (Long-tailed Titmouse).—Common in winter 1907-8 in Mull, but not found nesting 1908. Building at Darnley (Glasgow), 11th April.
- PARUS MAJOR (Great Titmouse).—In song, Mull, 10th January, lays at Kirkliston, 20th May, and last in song there, 18th June. On 2nd December at Largo uttering its spring-note again.
- P. ATER (Coal-Titmouse).—Sings at Kirkliston, 6th February till 18th June, and young away there, 22nd. Two got at the Bass Rock, 28th September (p. 49).
- TROGLODYTES PARVULUS (Wren).—Laying at Kirkliston, 9th May, and last in song there, 23rd August. Regains song, 17th September. A few at the Isle of May 3rd, 7th, and 8th October, one at Monach 26th, and half a dozen occurrences in November at the Flannans.
- MOTACILLA LUGUBRIS (Pied Wagtail).—Numerous at Lamlash, 22nd February, returned to Largo (Lahill), 15th March, common on river Kelvin, 22nd. Laying at Kirkliston, 29th April. Swarms in the fields at Largo, 6th September. Almost daily on the Isle of May, 10th September till 2nd October (p. 12).
- M. ALBA (White Wagtail).—At Lerwick, 11th March; Stromness, 17th ("Ann. Scot. Nat. Hist.," 1908, p. 181); river Kelvin near Glasgow, 22nd. Five Clyde reports April and Mull, 24th (1), and 27th (2). Lerwick, 5th and 8th May; Dornoch 23rd (1). Supposed nesting Killilan (N.W. Highlands) ("Ann. Scot. Nat. Hist.," 1908, p. 253). Ten reports in autumn from all points between 30th August, Largo, and 25th September, Bunessan (large numbers at last).
- M. MELANOPE (Grey Wagtail).—Laying, Kirkliston, 15th April; young on wing, Caldwell (Renfrew), 15th May; eighteen on shore together at Fairlie (Ayr), 23rd November.
- M. FLAVA (Blue-headed Yellow Wagtail).—Probably bred near Aberdeen ("Ann. Scot. Nat. Hist.," 1908, pp. 253-254). Added to the Fair Isle fauna during the year (p. 72).

- M. RAII (Yellow Wagtail).—Beith (Ayr), 1st May; Duddingston, 4th, two pairs (Evans); Thornliebank (Renfrew), 3rd; Possil and Cathcart (Glasgow), 5th.
- ANTHUS TRIVIALIS (Tree-Pipit).—Rouken (Glasgow), 26th April; Caldwell, 27th; Kirkliston, 2nd May; Mull, 3rd (about 12). Last in song, Kennishead (Renfrew), 7th July. Breeding, Glenshee district at 800-900 ft. elevation ("Ann. Scot. Nat. Hist.," 1908, p. 181). Kirkliston, 4th September, last mainland observation. Iona, a few passing south on 21st and 26th September. Flannans, 25th, one sent. Isle of May, 26th and 28th (one each) (p. 12).
- A. PRATENSIS (Meadow-Pipit).—Mull, arrived on moors, 12th February (6); returned to Caldwell, 21st March; numerous on river Kelvin, near Glasgow, 22nd. In song at Mearns (Renfrew), 19th July. Large flocks at Swordale, 10th September. In Isle of May, from 10th September till 8th October, almost daily; one singing, 15th September. Many at Butt of Lewis, 18th, and going south at Iona, 21st-25th.
- A. CERVINUS (Red-throated Pipit).—Twice observed in the Fair Isle in autumn (p. 72). New to Scotland.
- A. RICHARDI (Richard's Pipit).—Several in autumn in the Fair Isle (p. 72).
- ORIOLES GALEBULA (Golden Oriole).—Near Markinch, about 10th May, one (♀) found dead ("Ann. Scot. Nat. Hist.," 1908, p. 180). On Fair Isle (p. 71) in spring and autumn.
- LANIUS EXCUBITOR (Great Grey Shrike).—Mull, 12th February (1); Auchencairn (Arran), 8th April (1); Gilston (Fife), 22nd (1) ("Ann. Scot. Nat. Hist.," 1908, p. 180); Turnberry (Ayr) one observed 25th. On 17th October at Latheronwheel, Caithness, ♂ shot; at Isle of May one (♀) caught, 25th (p. 13).
- MUSCICAPA ATRICAPILLA (Pied Flycatcher).—Spiggie (Shetland) (1) ("Ann. Scot. Nat. Hist.," 1908, p. 183); observed near Glendoune (Ayr), 14th June. At Sule Skerry, on 22nd September, (1) (p. 48), and one at Flannans on same date. From the 19th till 28th daily, except 27th, on Isle of May, including many on 24th and 25th (p. 13). One observed at Airdrie Wood, Crail, on 20th and 21st October.
- M. GRISOLA (Spotted Flycatcher).—Isle of May, 7th May (1) (p. 13); Colinsburgh and Kirkliston, 8th; Carmichael (Lanark), 9th; Balgray (E. Renfrew), 10th. "A very scarce nesting species indeed" in Mull, "the very opposite of last year." Very rare at Kinloss, where last year "were many in all the wooded parks within three or four miles of this place." Nesting at Kirkliston, 3rd June, and has second brood there, 11th July; nest with

five pale blue eggs without markings at Beith, not a Pied Flycatcher's. Plentiful, 4th August to 3rd September, Largo. Last at Swordale, 12th September. Last on Isle of May, 25th and 26th September (p. 13).

M. PARVA (Red-breasted Flycatcher).—Butt of Lewis, 1st November, one (p. 48). Outer Hebrides, 3rd November, one (p. 3).

HIRUNDO RUSTICA (Swallow).—On 12th April one at Beith, and on same date one at Cambuslang. Thereafter until 25th inclusive, not a single report! From 26th till 3rd May inclusive, reports from sixteen localities chiefly on and from 30th April. Lays at Kirkliston, 16th May. On 4th July, at Mearns (Renfrew), in a nest in which young had been brought out this year were four eggs of the second laying slightly incubated. At Kirkliston young still in nest on 21st September, and on October 1st, in Mull, second brood of a pair left with their parents. Corsock (Kirkcudbrightshire), 22nd November.

CHELIDON URBICA (House-Martin).—Abundant, Lamlash, 30th April; 1st May, Dalry (Ayr), and same date Colinsburgh (1); other five localities on mainland, 2nd and 3rd respectively. In Mull two pairs arrived, 11th. On 27th June completes nest at Mearns (Renfrew) in five days. At Mull second brood left nest, 30th August. One in Mull on 5th November.

COTILE RIPARIA (Sand-Martin).—On 31st March at Lamlash (3); at Rouken Glen (Glasgow) on 5th April, one, but this species not again seen there till 3rd May (several). On 13th April at Duddingston (1) (Evans). Chiefly observed from 27th April till 7th May. Monach on 26th October.

LIGURINUS CHLORIS (Greenfinch).—Sings at Colinsburgh on 24th February, and nest and two eggs there, 16th April. 19th July, at Mearns, nest in hedge built almost entirely of sheep's wool. Flocking in large numbers at Mull on 22nd August. Last in song at Kirkliston on 24th August. A lot on the Isle of May on 17th October (p. 14). Several at Butt of Lewis on 9th November.

COCCOTHAUSTES VULGARIS (Hawfinch).—At the Grove Gardens (Galloway), 9th April, ♀ accidentally trapped ("Ann. Scot. Nat. Hist.," 1908, p. 253). At Tyneholm, Pencaitland, 3rd July, young ♂ (p. 48). At Lauder (Berwick), ♀ and one young in August (*l.c.*, pp. 252, 253). One in spring on the Fair Isle (p. 71).

CARDUELIS ELEGANS (Goldfinch).—Cathcart (Renfrew), 21st March (5); Williamwood (E. Renfrew), 22nd May (♂); Symington (Lanark), 4th July, two pairs.

- C. SPINUS (Siskin).—Small number on Isle of May, 22nd September till 28th October (p. 13). At Butt of Lewis on 9th October (1). At Swordale (E. Ross) on 25th October (1). In Mull on 11th November, seven feeding on seeds of *Centaurea nigra*, the first time Mr. MacDonald has seen it in Mull.
- PASSER MONTANUS (Tree-Sparrow).—On 8th June, two near Ardmillan (Girvan). Pair seen by the shore at Swordale, 20th July. Isle of May, 10th September—8th October, a small party 5-3. At Swordale on 13th October, a few.
- FRINGILLA CŒLEBS (Chaffinch).—Sings at Colinsburgh and Kirkliston on 6th February. Nest and one egg at Swordale on 6th May. Last in song, 2nd July. Flocks at Scotsraig, 10th July. At Isle of May, a lot in the big rush of 28th October (p. 14).
- F. MONTIFRINGILLA (Brambling).—At Colinsburgh huge flock, 20th February, and very numerous there and at Largo from 22nd March till end of April. At Largo, 4th May (1); Swordale, two (♂); 6th May, Butt of Lewis (2). In autumn, a few on 7th September at Sandbank, Holy Loch (Clyde), 25th, two at Isle of May, and on 9 days from 26th till 8th October, there. In N.W. Mull, 50 or so on 4th November, 100 next day. A number at Inchnadamph (West Sutherland) on 25th October, a district to which they are new (pp. 47-8).
- LINOTA CANNABINA (Linnet).—On Isle of May, 19th September, 6th, 7th, and 8th October (1, 3, 1, 1). Enormous flocks on 26th October at Swordale, and huge flocks on 26th November at Largo.
- L. LINARIA (Mealy Redpoll).—Single birds on Isle of May on 13th and 18th January, 8th February, and 12th March. Two at the Flannan Islands on 7th September, and two on 16th. Two at Butt of Lewis on 8th November.
- L. [RUFESCENS (Lesser Redpoll).—A few at Killiechronan pine woods, Mull, on 18th April. Crail, about a dozen on 24th October, flock of over a hundred at Sandbank (Clyde) on 8th November, and a small flock at Swordale feeding on nettle seeds on 17th December.
- L. FLAVIROSTRIS (Twite).—In N.W. Mull on 19th July, thirty or so already flocking. At Fairlie (Ayr), on 26th December, flock of over a hundred.
- PYRRHULA EUROPEA (Bullfinch).—In Mull, 14th March, 7th April at larch buds. One at Lahill (Largo) on 5th April. At Skelmorlie (Ayr), hatched out about 5th August, and pair feeding four young at Caldwell, 8th August. One at Monach, 18th October. Fairly common in N.W. Mull, 8th-15th November, at seeds of *Rumex crispus*, *Spiræa Ulmaria*, *Senecio Jacobæa*, and *Scabiosa succisa*.

- P. ERYTHRINA (Scarlet Grosbeak).—At Isle of May on 12th September, one (♀) adult (p. 14).
- L. BIFASCIATA (Two-barred Crossbill).—One at Fair Isle in spring (p. 71).
- EMBERIZA MILIARIA (Corn-Bunting).—At Lerwick, 17th May, large flock. At Kirkliston local birds disappeared in late August, returning towards the end of the following March. At Butt of Lewis three on 18th October. On 2nd November a good many in flocks at Wick. Seventy or more at Dumfries, 12th December.
- E. CITRINELLA (Yellow Bunting).—Sings at Kirkliston, 13th February, Colinsburgh, 20th. Laying at Kirkliston, 16th April. Still feeding young on Craneflies near Largo, 14th August. Last in song, Kirkliston, 24th.
- E. CIRLUS (Cirl Bunting).—One (♂) young, killed by a cat at Thurso on 9th January, preserved for Dunrobin Museum.
- E. RUSTICA (Rustic Bunting).—Single birds on both passages at the Fair Isle (pp. 71-2).
- E. PUSILLA (Little Bunting).—One at Sule Skerry, 22nd September, captured and sent for identification (p. 48).
- PLECTROPHENAX NIVALIS (Snow-Bunting).—At the Flannan Islands six observations in March, four in April, two in May, one on 19th June. Largest number about a hundred on 16th March. In autumn there, first one observed on 7th September, and regularly till 5th October in ones and twos; numbers increasing thereafter.
- STURNUS VULGARIS (Starling).—Largo, 18th January, thousands; Glenorchard, Glasgow, have left, 12th March; Flannans in small parties, 10th-30th; Sule Skerry, 24th, several; Isle of May, 26th, great flocks (p. 15); same locality, 1st April, rush all night; at Kirkliston, young spend three weeks in nest (April); Fenwick (Ayr), not less than five thousand flew over E. to W. on 27th July; on the Isle of May, 10th September to 8th October; Flannans, 18th October, thousands, and numerous till 24th, and from 28th October till 30th November small parties.
- PASTOR ROSEUS (Rose-coloured Starling).—One adult male at Fair Isle in spring (p. 76). One seen about half a mile E. of Reay on 2nd July ("The Field," 11th July 1908, p. 91). Clayock, near Georgemas, one (♂) shot, 7th July.
- CORVUS MONEDULA (Jackdaw).—Isle of May, great flocks for some days about 26th March (p. 15). Kirkliston, 17th April, lays. At Swordale enormous flocks, 18th September. At Largo large flocks, 29th November.

- C. CORONE (Carrion Crow).—Young thirty-three days in nest at Kirkliston on 14th April.
- C. CORNIX (Hooded Crow).—Great flocks on Isle of May on 26th March (p. 15). A lot at Largo on 27th November.
- C. FRUGILEGUS (Rook).—Courting antics at Largo, 19th February; building Kirkliston 26th and laying there 14th March. Great flocks on Isle of May on 26th March (p. 15). Two at the Flannans on 10th and 14th March and 6th April. A large flock on the Isle of May on 28th October (p. 15).
- ALAUDA ARVENSIS (Sky-Lark).—Kirkliston, sings on 21st January. At Salen, N.W. Mull, on 25th March, which is late; song heard next day. Last in song, Kirkliston, 21st July. Song regained, 12th September, Kirkliston.
- CYPSELUS APUS (Swift).—Caldwell, 29th April (1); Beith, 1st May; Burdiehouse (Edinburgh), 1st; Killermont (Glasgow), 2nd, half a dozen; Leven, same date (1); Barnton, 3rd (1); Lamlash, Carmichael (Lanark), Kirkliston, and Duddingston (many), 4th; Forfar, 5th May, many, and Swordale same date. Largo, 1st September (1); Kirkliston (2) on 2nd; Butt of Lewis (2) on 24th, Flannan Islands on 24th and 25th.
- CAPRIMULGUS EUROPÆUS (Nightjar).—Lamlash, 4th May; N.W. Mull, 18th, one (♂).
- IYNX TORQUILLA (Wryneck).—Isle of May, 20th September (1); 26th, same place, one (p. 16).
- DENDROCOPUS MAJOR (Great Spotted Woodpecker).—Sandside, Reay, 6th March, one (♂) shot. Bridge of Allan, 21st April, one found dead ("The Field," 2nd May 1908, p. 748).
- UPUPE EPOPS (Hoopoe).—Geanies, Ross-shire, one on 9th September ("The Field," 19th September 1908, p. 547).
- CUCULUS CANORUS (Cuckoo).—Caldwell, 27th April; Bishop Loch (Glasgow), 28th; Dalry, 29th; Auchencairn (Arran), 30th, seen and heard. Beith and Largo, 1st May; Erskine and Crosswood, 2nd. Dunipace invaded ("Annals of Scot. Nat. Hist.," 1908, pp. 181-2). Cairnie, last week of June, one seen repeatedly eating larvæ of *Abraxas grossulariata* off gooseberry bushes. Beith, young one with call-note like Meadow Pipit's, but uttered more rapidly. Last heard, Mull, 3rd July. A bird of the year procured on Isle of May on 20th August (p. 16).
- ASIO OTUS (Long-eared Owl).—On 15th March at Kirkliston, nest and three eggs. Mr. Brock says it appears to leave its nesting haunts there partially at least in winter.

- A. ACCIPITRINUS (Short-eared Owl).—A few in spring, first week in March till first week in May, on the Isle of May, and again there in autumn, 24th September till 13th November. Beattock, 2nd May; Kilchattan, 30th May; Caithness, 16th October.
- SYRNIUM ALUCO (Tawny Owl).—Kirkliston, 20th April, nest and three eggs.
- NYCTALA TENGMALMI (Tengmalm's Owl).—Shetland, 4th January, an adult (♀) ("The Field," 4th April 1908, p. 583).
- SCOPS GIU (Scops-Owl).—One near Largo, 16th May ("Annals of Scot. Nat. Hist.," 1908, pp. 180 and 183).
- CIRCUS CYANEUS (Hen-Harrier).—Brawl Castle, one (♀) on 31st January: "very rare now."
- BUTEO VULGARIS (Buzzard).—Fairlie (Ayr), one on 27th September. A pair appeared at Swordale on 30th October and continued there till 26th December.
- AQUILA CHRYSÆTUS (Golden Eagle).—One observed at Swordale on 28th October.
- FALCO CANDICANS (Greenland Falcon).—One from the Flannan Islands, 8th March ("Annals Scot. Nat. Hist.," 1908, p. 183).
- F. ISLANDUS (Iceland Falcon).—An adult killed in December in the Flannan Islands ("British Birds," February 1909, p. 310).
- F. PEREGRINUS (Peregrine Falcon).—At Possil Marsh, near Glasgow (pair, ♂ and ♀), 29th April. Pair arrived at Swordale on 17th October, with Redwings, whom they hunted.
- F. ÆSALON (Merlin).—Butt of Lewis, a pair on 30th April; and on 27th August there, two caught in the engine-room, which they entered in pursuit of a Wheatear. Again seen at same place, 2nd November, and "have been numerous about lately (29th December)." One on Isle of May, 26th September to 8th October (p. 16).
- PANDION HALIÆTUS (Osprey).—May, Loch Spiggie (Shetland), one ("Annals of Scot. Nat. Hist.," 1908, p. 183).
- BOTAURUS STELLARIS (Bittern).—Whittingehame, 8th January, one (♂) captured alive ("Annals Scot. Nat. Hist.," 1908, p. 120). Aberlady, 6th April, one (*loc. cit.* pp. 183-4).
- ANSER CINEREUS (Grey Lag-Goose).—3rd November, 40-50 in stubble near Walten Loch, Caithness, and on following day a large "gaggle." In November and December "grey" geese very numerous, Dumfries, with marked preponderance of Grey Lags. Several which visited the Fair Isle were of this species (p. 74).

- A. *ALBIFRONS* (White-fronted Goose).—Arrived three weeks later than usual at Tiree, "having been kept back by continuous S.E. winds" (p. 51). Arrived much later than usual, Barra and South Uist (p. 3).
- A. *SEGETUM* (Bean-Goose).—On 16th February at Bardowie Loch, near Glasgow, one, the sole record for the year.
- BERNICLA LEUCOPSIS* (Barnacle-Goose).—Parties up to fifty in number at the Flannan Islands from 17th March till 11th April. Hundreds arrived there to stay on 2nd November; large flock in the Outer Hebrides on 3rd November, and very large flock, South Uist, 6th; huge companies in Solway in December.
- B. *BRENTA* (Brent Goose).—A "good lot" in Cromarty Firth on 2nd January, and large flocks in Outer Hebrides on 3rd November (p. 4).
- CYGNUS MUSICUS* (Whooper Swan).—In the Outer Hebrides on 3rd November, thirteen flying over (p. 4). Considerable number at South Uist on 6th November (p. 4). Five on loch near Butt of Lewis on 7th December. Crowds in Tiree (p. 51).
- C. *BEWICKI* (Bewick's Swan).—At Bishop Loch (Glasgow), nineteen on 23rd February. Three reappeared there in October, which went off, and two which appeared in November went off likewise. Crowds in Tiree in end of year (p. 51).
- ANAS BOSCAS* (Mallard).—Nest and ten eggs at Kirkliston, 9th April. Enormous flocks at Largo, 20th November, the "greatest number we have ever seen."
- A. *STREPERA* (Gadwall).—One shot on the Dee at Castle Douglas, 6th January ("Annals Scot. Nat. Hist.," 1908, p. 119). Two pairs under observation on a loch in the East of Scotland (*loc. cit.* p. 254). Caldwell, 18th October (3). Young male shot, Tayport, 14th November (p. 49). One shot, Loch Spynie, 25th.
- SPATULA CLYPEATA* (Shoveler).—Lochwinnoch (Renfrew), 16th May, one male. Increasing yearly as a breeding species at Tiree ("Annals Scot. Nat. Hist.," 1908, p. 252). At Glenorchard (Glasgow), 18th September, two. At Kilconquhar Loch, two on 13th October.
- DAFILA ACUTA* (Pintail).—Increasing as a nesting species at Spiggie, Shetland ("Annals Scot. Nat. Hist.," 1908, p. 184). At Gad Loch, Lenzie, 14th November (1). At Edderton, Ross-shire, one, with a Danish metal-ring, shot ("The Field," 5th December 1908, p. 104).
- NETTION CRECCA* (Teal).—Seen on six days at Isle of May, 12th September to 7th October. At Sule Skerry, on 21st October, two.

MARECA PENELOPE (Wigeon).—Nest in heather with six eggs, 28th May, Awe. Brood of ten near Dornoch Firth, 27th June. Reappeared in Cromarty Firth on 11th August, a small flock. Two flocks on 13th at Swordale (E. Ross). Reappeared at Hopetoun on 27th September.

FULIGULA FERINA (Pochard).—Last seen Linlithgow, 13th March; N.W. Mull, 5th April (2). Watten Loch, Caithness, a lot on 9th July. Reappears Linlithgow Loch, 25th September; Loch Libo, 13th October. At last named on 18th October (44), 22nd (55), 4th November (120), 15th (220), 6th December (120).

F. MARILA (Scaup Duck).—Glen Dam (E. Renfrew), 18th September (1).

CLANGULA GLAUCION (Golden-eye).—Loch Leven, 16th May and 5th June, eighteen; Loch Coulter (Denny Hills), 10th June, nineteen (p. 50). Glen Dam (E. Renfrew), 18th September, one (♂ juv.).

HARELDA GLACIALIS (Long-tailed Duck).—On the Spey, forty miles inland, in October, one (ad. ♀) (p. 49). Balcomie (Crail), 21st October, four or five.

SOMATERIA MOLLISSIMA (Common Eider-Duck).—At the Flannan Islands, at Sule Skerry, at Butt of Lewis, and in N.W. Mull, small movements, 8th March-17th April. Bred in June at Colvend, Kirkcudbrightshire; young in down seen there in July. At the Flannan Islands in decreasing numbers from September till 12th November (2).

CEDEMIA NIGRA (Common Scoter).—A large flock off Graemsay, Orkney, in first week of March ("Brit. Birds," ii. p. 166). At Lendalfoot (S. Ayr) great flocks of Scoters; supposed this species going south on 2nd November—a very uncommon sight, none of the Scoters being numerous there at any time.

MERGUS MERGANSER (Goosander).—Twenty to twenty-eight passed the winter at Linlithgow Loch; last appearance there, a pair, 20th May (p. 50). Reappeared there 21st August (1), but no increase till 23rd November (15). At Loch Libo (Caldwell), 9th November till 5th April (1), in varying numbers, usually three, four, or six.

M. SERRATOR (Red-breasted Merganser).—At Largo, a lot displaying on 19th February; several still there, 6th May. At Cromarty Firth, one with eighteen young on 14th July. At Largo on 10th November, about 30; and in Barra Sound, early in November, 300 in one small bay (p. 4).

M. ALBELLUS (Smew).—At Dalswinton, Dumfriesshire, on 6th January, two immature.

- COLUMBA PALUMBUS* (Ring-Dove).—Flock of about 100 at Monturpie, Largo, 6th May. Noticed in increasing numbers as a breeding species in the island of Shapinsay, Orkney, in 1907 and 1908 ("British Birds," 1909, p. 345).
- C. CENAS* (Stock-Dove).—On 26th April two nests at Cathcart on the Cart, which is here the county boundary. One of the nests was in Lanark and the other the first found in E. Renfrew. Four pairs located at Blantyre (Lanark), where it was reported to be nesting in 1906 (p. 115).
- TURTUR COMMUNIS* (Turtle-Dove).—One on 3rd October at the Flannan Islands.
- TETRAO TETRIX* (Black Grouse) × *LAGOPUS SCOTICUS* (Red Grouse).—Immature male hybrid, killed 6th October in Glen Trool, Kirkcudbrightshire ("Brit. Birds," ii. p. 386).
- COTURNIX COMMUNIS* (Quail).—One heard near Fentons, East Lothian, 6th June (Evans).
- CREX PRATENSIS* (Corn-Crake).—Dalry (Ayr) and Braid Hills, 1st May; Kirkliston, 2nd; Auchencairn (S. Arran), 3rd; and throughout the country from 4th to 10th.
- RALLUS AQUATICUS* (Water-Rail).—One in N.W. Mull on 26th March, where it is rarely met with in spring; one at Monach Island, 26th October.
- FULICA ATRA* (Common Coot).—In hundreds in the sea and on shore of Cromarty Firth on 2nd January. At Colinsburgh, 4th April, nest with five eggs; hatched, 27th; the old bird killed a water-vole in the water, 1st May; young begin to get white breast, head being still red, 16th May; young begin to get white frontal shield and second family hatched, 30th June.
- GLAREOLA PRATINCOLA* (Pratincole).—Adult female on 13th July at the Flannan Islands ("Annals Scot. Nat. Hist.," 1908, p. 256).
- EUDROMIAS MORINELLUS* (Dotterel).—Small flock in East Lothian, 11th and 13th May (Evans).
- Æ. CURONICA* (Little Ringed Plover).—One shot on North Uist in October ("The Field," 20th February 1909, p. 329).
- CHARADRIUS PLUVIALIS* (Golden Plover).—Arrives on the moors in Mull, 11th March; flock at Butt of Lewis, 12th; on the moors at Caldwell (Renfrew), 20th; nest and four eggs at Beattock, 16th April.
- VANELLUS VULGARIS* (Lapwing).—On the morning of 11th February 1500-1800, which had been near Mr. Service's residence at Dumfries for three weeks, suddenly showed signs of restlessness. "In a few minutes the whole flock were on the wing, and

going through a lot of movements that they had not previously shown. By and by in a very compact body, they headed N.N.W., and were out of sight in less than another minute, going high and swiftly."

PHALAROPUS HYPERBOREUS (Red-necked Phalarope).—One taken at the lantern, Sule Skerry, on 29th October.

SCOLOPAX RUSTICULA (Woodcock).—At St. Blane's, Bute, on 19th April a nest with one egg, on 20th two eggs, and on 21st three. On 22nd, still three; and on revisiting it on 23rd a Curlew was seen to rise from the Woodcock's nest, which then contained but one egg and some fragments of shells. This was during the cold snap, and Mr. William Rennie, who sends the story, asks, "Could it be the Curlew that had devoured the eggs? and why was the Curlew there at all?"¹

GALLINAGO CÆLESTIS (Common Snipe).—Drumming at Crosswood, West Calder, 10th February. In Mull, in mid-April, of two hundred observations on snipe drumming, about forty successful; *i.e.* the main contributory conditions to the act being fairly accurately seen. In every case the characteristic outspreading of the two outer tail-feathers was present, and the volume of sound depended on the steepness of the gradient of descent, being scarcely audible when this was but little removed from the horizontal. Pure white one, with black eyes, shot at Coll ("The Field," 5th December 1908, p. 1021).

G. GALLINULA (Jack Snipe).—Fourteen on the Flannan Islands on 14th September. Six killed at Monach, 23rd October.

TRINGA ALPINA (Dunlin).—At Gad Loch near Glasgow, 26th April, two on passage. One of the small race sent from the Flannan Islands on 14th September.

T. MINUTA (Little Stint).—Two this year's birds at Aberlady Bay (Evans), 29th August.

T. TEMMINCKI (Temminck's Stint).—Appeared at the Fair Isle in autumn (p. 74).

T. SUBARQUATA (Curlew-Sandpiper).—Three this year's birds at Aberlady Bay, 29th August (Evans). One young bird at the Glen Dam (E. Renfrew) on 25th October.

¹ I have quite a pile of material showing repeated captures of Curlews by steel traps which had been baited with eggs for Hooded or Carrion Crows. I have had these materials in my possession for some years back, and I refrained from the publishing of them, and my conclusions concerning them, lest I might do an injustice in any direction. I may now add, that since, by my orders, abundance of "grit" has been laid down where "grit" was at decidedly a low ebb before on my ground, there has been no recrudescence of Curlews being caught in steel traps baited with eggs.—J. A. HARVIE-BROWN.

- T. STRIATA* (Purple Sandpiper).—At the Flannan Isles until 24th March (10). Reappeared there 28th August (2). Small numbers on the Isle of May, 13th-27th September, on four days.
- T. CANUTUS* (Knot).—Moray Firth, several in summer plumage on 27th July. Aberlady Bay, 29th August (30 to 40) (Evans).
- CALIDRIS ARENARIA* (Sanderling).—A flock of a dozen with buffish throats on 27th July in Moray Firth. Largo, 9th August (2), 12th (1). Aberlady Bay, 29th August (30) (Evans). A few in Dornoch Firth on 1st December.
- MACHETES PUGNAX* (Ruff). — Near Dornoch Firth on 11th September, three observed, one (♂) shot. At Caerlaverock, Dumfries, 15th, one shot.
- TOTANUS HYPOLEUCUS* (Common Sandpiper).—Dalry (Ayr), 19th April; mouth of Endrick, Loch Lomond, 20th; Beith and Cathcart, 26th; Hogganfield (Glasgow), 27th; Carmichael (Lanark), 28th; Caldwell, 29th—all these localities in "Clyde." Crosswood (West Calder), Edinburgh (Evans) and Beattock, 30th. Observed at Linlithgow Loch on 25th September, which is later than usual, and on 26th one was killed at Tarbatness Lighthouse.
- T. OCHROPUS* (Greenshank).—Swordale, one by the shore on 3rd September; Dalmeny, 24th; Swordale, 12th October (2); Moray Firth, 14th November (1); Cromarty Firth, 17th December (1). One in autumn at the Fair Isle (p. 74).
- T. GLAREOLA* (Wood-Sandpiper).—Occurred in the Fair Isle during the year (p. 74).
- LIMOSA LAPPONICA* (Bar-tailed Godwit).—Flocks observed at Swordale (E. Ross) on 6th, 9th, 15th, 25th May, and 12th, 17th, 24th June. A dozen there on 20th July and a large flock on 27th. Aberlady Bay, 29th August (200) (Evans).
- L. BELGICA* (Black-tailed Godwit).—One frequented the west side of Iona, 21st-26th September. When seen feeding it probed in the ooze right to the proximal end of the bill, whereas the Bar-tailed species picked up their food like the Redshank. One in mid-winter at the Fair Isle (p. 74).
- NUMENIUS ARQUATA* (Curlew).—Party after party passing over Dumfries on 11th February, and through the night proceeding N.N.W. This movement continued at intervals to the 27th. On 10th February appeared at Crosswood (West Calder); 21st, Glenorchard (Glasgow); 24th, Beattock. Passing over Glasgow, 5th May. Leaving moors in Mull, 22nd-27th June.

- N. PHÆOPUS (Whimbrel).—At the Flannan Islands observed on thirteen days from 4th May till 28th June; the largest party a dozen, on 5th June. Again on 28th August. Several at Butt of Lewis on 30th April, and large flock on 6th May. At Sule Skerry on 7th May (5). Dunbar, 8th August (1) (Evans).
- HYDROCHELIDON NIGRA (Black Tern).—One (♂) obtained, Hose-law Loch, near Kelso, on 28th April—another in its company ("Annals Scot. Nat. Hist.," 1908, p. 254). One at Peebles, 30th May (*loc. cit.* p. 254). One, immature, observed at Aberlady, 29th August (*ibid.*).
- STERNA CANTIACA (Sandwich Tern).—A few at Largo, 6th May, and a few west of North Berwick, 9th (Evans). On 13th, 15th, 17th September, and 4th October, small numbers seen at the Isle of May (p. 18). On 14th October, off Barsalloch Point (Wigtown), one observed, believed to be this species ("The Field," 24th October 1908, p. 721).
- S. FLUVIATILIS (Common Tern).—Eight at Possil Marsh, Glasgow, on 29th April; Aberlady, 1st May, a few; 6th, Largo, a good many; 11th, Sule Skerry, great numbers; 29th May, Butt of Lewis, many first seen. One sitting on three eggs in Fife, 4th July. Several at Hopetoun, 4th October.
- S. MACRURA (Arctic Tern).—At Lerwick, 18th and 20th May.
- S. MINUTA (Little Tern).—Kincraig Point, 20th May (2).
- LARUS MINUTAS (Little Gull).—One shot at Newburgh (Aberdeen) ("The Field," 16th January 1909, p. 118).
- L. RIDIBUNDUS (Black-headed Gull).—In summer dress, Glasgow, 16th February. The persecution of the Lapwing in autumn and winter by this species is the subject of notes in these pages (1908, p. 255; 1909, pp. 50 and 117), but none of the writers has noticed the fact to which Mr. Hugh W. Wilson draws attention, viz. that with the advent of spring the Lapwing is the aggressor—at any rate that is the case on the grass lands of Mearns Moor, where this species is common in the nesting-season, and over which great numbers of Black-headed Gulls are constantly passing to and from the great gully at Harelaw Dam.
- L. CANUS (Common Gull).—Hundreds of nests at Loch Awe on 23rd May, but only in one instance four eggs.
- L. FUSCUS (Lesser Black-backed Gull).—Appears Glasgow Harbour, 18th March (2); Mull, 28th (1). Beginning to lay at Swordale, 2nd June.
- L. LEUCOPTERUS (Iceland Gull).—From 8th January till 4th April, one in N.W. Mull.

MEGALESTRIS CATARRHACTES (Great Skua).—Two at Lerwick, 8th June, and one at Isle of May, 6th October.

S. CREPIDATUS (Arctic Skua).—Shurrery (Reay), 8th August, one shot, and one after Terns, Dunbar, same date (Evans); at Isle of May, single birds on six occasions, 12th Sept.-6th Oct.; Dalmeny, 12th October; Balcomie, 18-20th, single birds; Keiss, 4th November (1).

U. LOMVIA (Brunnich's Guillemot).—On 11th December one picked up at Craigielaw Point (Haddington) (pp. 75-76).

U. GRYLLE (Black Guillemot).—Small parties at Butt of Lewis on 7th March, first for season. Several at Sule Skerry on 5th April. Had left Butt of Lewis with young by 1st September.

MERGULUS ALLE (Little Auk).—One on 9th March at Gullane Point ("Annals Scot. Nat. Hist.," 1908, p. 185).

FRATERCULA ARCTICA (Puffin).—At the Flannans on 10th April, several. Great numbers at Sule Skerry on 15th. Left Sule Skerry on the evening of 8th August in great numbers, flying very high.

COLYMBUS GLACIALIS (Great Northern Diver).—Over forty in Hoy Sound, Orkney, on 6th March, and considerably over a hundred off Graemsay on 6th April ("Ann. Scot. Nat. Hist.," 1908, p. 185). One during the winter of 1908 at the Fair Isle (p. 75).

P. NIGRICOLLIS (Eared Grebe).—One got at Helensburgh in January exhibited at meeting Nat. Hist. Soc. of Glasgow.

P. FLUVIATILIS (Little Grebe).—At Isle of May, one found dead on 24th September, and one in pond there 1st-2nd October (p. 20).

OCEANODROMA LEUCORRHOA (Fork-tailed Petrel).—On the coast near the Don (Aberdeen), 5th January, one (♀) ("Annals of Scot. Nat. Hist.," 1908, p. 120). At Flannan Islands, one at lantern on 6th April. One at lantern at Sule Skerry, 5th August. Three captured at Sule Skerry on 21st September, where it is rarely seen (p. 118). One at lantern on Isle of May on October 6th (p. 19).

PUFFINUS ANGLORUM (Manx Shearwater).—Frequented Sound inside Ardnamurchan Head from end May. On 15th June several were caught and drowned on Haddock lines, baited with pieces of herring, which they stripped off before sinking to the bottom. The fishermen assured Mr. Macdonald that by using their wings, their progress under water is marvellously rapid.

THE RECENT REMARKABLE VISITATION
OF CROSSBILLS.

By WM. EAGLE CLARKE, F.L.S., F.R.S.E.

THE summer of 1909 will be remembered by ornithologists for its remarkable visitation of Crossbills (*Loxia curvirostra*). During late June, all July and August, these birds were widely spread over Great Britain, but seem to have come most under notice at the Northern Islands of Scotland, where forests and other cover are non-existent.

These early summer migrations are not very unusual on the part of the Common Crossbill. It has long been known, for some reason not as yet determined, that at the close of the breeding season, which is an early one, these birds and their young quit their continental forest homes to appear among us, and occur in the most out-of-the-way and, for their food requirements, unsuitable places. The irruption, however, of 1909 is remarkable for the number of the visitors, and the wideness of the area covered.

They were first detected on Fair Isle, where Stewart Stout, our bird-watcher, saw the first on the 23rd of June. Their numbers afterwards increased, as if the birds had come to the island in a series of waves, and as many as 300 were seen some days. They remained on the island throughout July, but their numbers fell off towards the end of that month. They were observed there, however, during the whole of August in small parties.

In Unst, the northern island of the Shetland group, on the 27th of June, an adult male came under the notice of Dr. Edmondston-Saxby, who, in reporting the occurrence, remarked that he had only once previously seen this bird in summer.

In the neighbourhood of Lerwick they were first observed on the following day, and from that day onwards until the 13th of August, the day on which he wrote me last, Mr. J. S. Tulloch tells me that he saw small parties, but never more than a dozen strong. He, however, heard of as many as thirty having been seen in a flock; and he had Crossbills, in

varying numbers, reported to him from Unst, Yell, North Mavine, Whalsay, Bressay, Tingwall, and several other places. Mr. Thomas Henderson, jun., saw many in the neighbourhood of Sumburgh Head, including a flock of forty birds; and he informs me that a number were taken on the fishing boats at sea to the eastwards of the Shetlands.

In Orkney many were observed near Kirkwall, and a small flock visited the Island of Sanday; but no dates are afforded. The most remarkable circumstance in connection with the occurrence of the Crossbills in this group of islands relates to their appearance in numbers at the remote rocky islet of Sule Skerry, which lies out in the Atlantic some thirty-three miles west of Hoy. Here one was captured at the lantern on the night of 28th June. More were seen afterwards, forty-two being the largest number. They remained on this almost desert island for about three weeks. Mr. Moore, to whom I am indebted for this information, tells me that he found several dead amid the Arctic Tern's quarters, and he is of opinion that the Terns killed them for invading the precincts of their territory.

In the Outer Hebrides¹ Mr. Robert Clyne saw a small party, containing some old males, near the Butt of Lewis on 28th June. At the outlying Flannan Islands Mr. Robert Anderson writes me that a great many visited them late in June and remained about five weeks on Eilean Mor. Mr. Harvie-Brown received information that two were seen at Lochmaddy in North Uist.

On the mainland of Scotland, eight are recorded as visiting a garden at Wick, where they sojourned for a fortnight. On 9th July a flock of about twenty alighted on a steamer off Bervie, on the Kincardineshire coast, and remained on board for several hours. Others are recorded for Fraserburgh and Hawick.

Specimens in "green" plumage—*i.e.* females and young—naturally predominated, but a fair proportion of old red males are mentioned as being present at localities where they occurred in any numbers.

In England they are recorded in varying numbers, from

¹ [Mr. Wm. Macgillivray, of Eoligary, Barra, reports the occurrence of flocks of 10, 20, and 30 Crossbills in that island since the end of June.—J. A. H. B.]

Northumberland, Yorkshire, Lincolnshire, Essex, Kent, Middlesex, Surrey, Sussex, Herefordshire, Devon, Cheshire, and Lancashire.

As to the food of these birds in the Scottish localities visited, few of which would afford their usual diet, it is interesting to relate the makeshifts that had to be resorted to. At Lerwick they were observed plucking daisies and feeding on the yellow centres of the flowers. At Fair Isle they fed on flowers and berries (last year's) growing on the high ground. At the Flannans they fed on the sea-pinks. In the garden at Wick they scooped the Green-fly off the shoots of the roses in a remarkable manner. Birds obtained at Fair Isle late in July were described as being as fat as butter.

These invaders swooped down upon our isles and shores from Northern Europe. This is certain, for a number of specimens received by me from various localities *all* belonged to the continental race, which is readily distinguished from the native Scottish bird by its smaller size and more slender bill. If further evidence were necessary to prove the origin of the visitors, it is afforded by the fact that among the flocks at Fair Isle and the Flannans, adult males of the Two-barred Crossbill (*Loxia bifasciata*) were detected and obtained. This rare visitor to our islands is a native of Northern Prussia and Siberia, and it is highly probable that it was present among the parties of the common species in fair numbers.

It is difficult to say what can have caused the birds to simultaneously quit the northern pine forests, and induced them to embark upon such adventurous voyages. We must look to our continental friends for the explanation, if such be possible. It is certain that some widespread incentive has influenced the birds, and caused this vast outpouring from their native haunts. The numerous birds reported would form a mere tithe of those which found their way to our islands, and many must have perished at sea. One came on board the fishery steamer "Goldseeker," in a dead-tired state, 95 miles E. by S.³/₄S. of Anskerry Light, Orkney, on July 12th, and allowed itself to be captured.¹

¹ Mr. John M'Kenzie *in litt.*

THE AQUATIC COLEOPTERA OF THE SOLWAY DISTRICT.

By FRANK BALFOUR-BROWNE, M.A. (Oxon.), F.R.S.E., F.Z.S.

(*Continued from p. 152.*)

Hydroporus erythrocephalus, *L.*—**Dumfries, Kirkeudbright, Wigtown.**

H. rufifrons, *Dufst.*—**Kirkeudbright**, Maxwelltown L., Cargen Burn, Dalbeattie; not uncommon in a few spots, but extremely local.

H. celatus, *Clark.*—**Kirkeudbright**, Criffel (Lennon).

H. melanarius, *Sturm.*—**Dumfries, Kirkeudbright**; a peat-moss species occurring not uncommonly at all altitudes.

H. memnonius, *Nic.*—**Dumfries, Kirkeudbright, Wigtown**; not uncommon.

H. obscurus, *Sturm.*—**Dumfries, Kirkeudbright, Wigtown**; a common peat-moss species.

H. nigrita, *F.*—**Dumfries, Kirkeudbright, Wigtown**; fairly common.

H. discretus, *Fairm.*—**Kirkeudbright**, Maxwelltown L., Kirkconnell, Lochfoot, Colvend, Dalbeattie; not common.

H. pubescens, *Gyll.*—**Dumfries, Kirkeudbright, Wigtown**; probably the most abundant species of the genus in the Solway district.

H. planus, *F.*—**Dumfries, Kirkeudbright**; common on salt marshes but not so common in other localities.

H. lituratus, *F.*—**Dumfries, Kirkeudbright.** Occasionally on peat mosses, but common on salt marshes. Fowler describes it as an inhabitant of stagnant ponds, especially in woods. I have never found it in woods, and in my experience it is common on the west coast in salt marshes.

H. obsoletus, *Aubé.*—**Kirkeudbright**, Cargen burn in flood (1); Criffel (1); Dalbeattie L. (1); only three specimens.

Agabus guttatus, *Payk.*—**Kirkeudbright**, Criffel, Bengairn, and Screel; probably common on high ground throughout the district in clear burns.

A. biguttatus, *Ol.*—Solway (Lennon).

A. paludosus, *F.*—**Dumfries**, Lochar Moss; **Kirkeudbright**, Maxwelltown L., Lochfoot, Colvend.

A. uliginosus, *L.*—**Dumfries**, "Tinwald Downs," M'Nab, one specimen Dublin Museum Coll.

- A. *affinis*, *Payk.*—**Dumfries, Kirkeudbright, Wigtown.** Fairly common, but localised so that it may occur in only two or three pools on a large peat moss, and in those pools it will be common. Both this species and the next are usually in mossy patches, and often do not turn up in the net until the pool has been thoroughly disturbed.
- A. *ungicularis*, *Thoms.*—**Kirkeudbright, Maxwelltown Loch** and three other spots; often with *A. affinis*, but whereas that species seems to specially favour Sphagnum, *ungicularis* is more common in Hypnum, and the pools therefore are more grassy. Fairly common in the four localities where it has been found.
- A. congener, *Payk.*—**Dumfries, Kirkeudbright, Wigtown;** peat mosses at quite low altitudes and in company with *A. affinis*. In other parts of Scotland I have always, so far, found this species on mountains. Not common but widely distributed.
- A. *nebulosus*, *Forst.*—**Kirkeudbright;** a “pond” species, but occasionally found in peat-moss holes even at high altitudes, e.g. Criffel top. Also common on salt marshes, giving place in more brackish pools to *A. conspersus*.
- A. *conspersus*, *Marsh.*—**Dumfries, Caerlaverock Salt Marsh (Lennon); Kirkeudbright, Preston Merse,** common in such localities.
- A. *femoralis*, *Payk.*—**Dumfries, near Moffat (Lennon); Kirkeudbright, Rockcliffe.** Lennon only found it in one pond near Moffat Well, and I only found it in one pond at Rockcliffe.
- A. *arcticus*, *Payk.*—**Dumfries, near Moffat, one specimen (Lennon); Kirkeudbright, on the side of the Rhinns of Kells, 700 feet up, one specimen.** Excepting Criffel, I have done no mountain work in the Solway district. The species is usually alpine and probably occurs on the high grounds of the district, although it does not seem to occur on the Criffel range.
- A. *sturmii*, *Gyll.*—**Dumfries, Kirkeudbright, Wigtown;** fairly common but somewhat local.
- A. *chalconotus*, *Panz.*—**Dumfries, Kirkeudbright, Wigtown;** peat mosses, fairly common.
- A. *bipustulatus*, *L.*—**Dumfries, Kirkeudbright, Wigtown.**
- Platambus maculatus*, *L.*—**Dumfries, Kirkeudbright;** a running-water species, and common. Almost certainly occurs in Wigtownshire, although I seem to have missed it.
- P. maculatus*, *var. immaculatus*, *Donnisth.*—**Kirkeudbright, R. Nith, R. Urr.**

Ilybius fuliginosus, *F.*—**Dumfries, Kirkeudbright, Wigtown.**

I. fenestratus, *F.*—**Kirkeudbright**, Lotus L. (1), Carlingwark L. (fairly common). There are seven specimens in the Lennon collection, although he does not mention the species in his MS. List. This is at present the only Scottish record for this species.

I. ater, *De G.*—**Kirkeudbright**, Cullochan L. and two ponds in district; decidedly scarce.

I. ænescens, *Thoms.*—**Dumfries, Kirkeudbright, Wigtown**; peat mosses, fairly common.

Copelatus agilis, *F.*—**Dumfries**, "Queensberry Hill" (M'Nab), one specimen in Dublin Museum Coll.

Rhantus exoletus, *Forst.*—**Kirkeudbright**, Lochaber L., Lochrutton L., Cullochan L., and a few ponds in the county; common where it occurs.

R. pulverosus, *Steph.*—**Kirkeudbright**, one specimen, Preston Merse.

R. bistriatus, *Berg.*—**Dumfries, Kirkeudbright, Wigtown**; moderately common, chiefly on peat mosses, less commonly in ponds.

Colymbetes fuscus, *L.*—**Kirkeudbright**, Maxwelltown Loch, Cullochan L., New Borean L., Preston Merse, Dalbeattie, Rockcliffe, and one or two other localities; not uncommon.

Dytiscus punctulatus, *F.*—**Dumfries, Kirkeudbright, Wigtown.**

D. marginalis, *L.*—**Kirkeudbright**; from my experience, scarce!

Acilius sulcatus, *L.*—**Dumfries, Kirkeudbright**; in large, deep peat holes where there is no weed, also in large, deep quarry-holes.

A. fasciatus, *De G.*—**Dumfries**, Racks Moss, Bankend; in large, deep peat holes in company with *A. sulcatus*; common where it occurs, but decidedly local.

Gyrinus minutus, *F.*—**Kirkeudbright**, Lochaber L.; **Wigtown** (J. G. Gordon).

G. elongatus, *Aubé.*—**Kirkeudbright**, Maxwelltown L. (Lennon), Cullochan L.; this seems to be the only Scottish locality at present recorded.

G. natator, *Scop.*—**Dumfries, Kirkeudbright, Wigtown**, Drumwalt L. (J. G. Gordon).

G. Suffriani, *Scriba.*—**Kirkeudbright**, Maxwelltown (Lennon).

G. opacus, *Sahlb.*—**Kirkeudbright**, Clonyard L.; **Wigtown**, R. Cree.

- Orectochilus villosus*, *Müller*.—**Dumfries**, R. Lochar; **Kirkeudbright**, R. Nith, Kirkgunzeon Burn; **Wigtown** (J. G. Gordon).
- Hydrobius fuscipes*, *L.*—**Dumfries**, **Kirkeudbright**, common in ponds and on salt marshes; absent or almost so from peat mosses.
- H. fuscipes*, *var. picicrus*, *Thoms.*—**Dumfries**, **Kirkeudbright**, **Wigtown**; the form almost invariably found on peat mosses, where it is fairly common.
- Philydrus maritimus*, *Thoms.*—**Wigtown** (J. G. Gordon).
- P. melanocephalus*, *Ol.*—**Dumfries**, **Kirkeudbright**, **Wigtown**.
A peat-moss species probably more common on high ground than on low ground.
- P. nigricans*, *Zett.*—**Dumfries**, **Kirkeudbright**; almost if not entirely confined to peaty ground. Not common.
- P. minutus*, *F.*—**Dumfries**, **Kirkeudbright**, **Wigtown**; a peat-moss species and common.
- P. coarctatus*, *Gredl.*—**Kirkeudbright**, **Wigtown**; fairly common but local, more common in ponds than on peaty ground.
- Anacæna globulus*, *Payk.*—**Dumfries**, **Kirkeudbright**, **Wigtown**.
- A. limbata*, *F.*—**Dumfries**, Lochar Moss; **Kirkeudbright**, Maxwelltown L., Rockcliffe, near Lochfoot; **Wigtown**, near Newton-Stewart; not common.
- Helochaeres punctatus*, *Sharp.*—**Dumfries**, Lochar Moss; **Kirkeudbright**, Kirkconnell Moss, Rockcliffe; **Wigtown** (J. G. Gordon); scarce. I am not sure that this is specifically distinct from *L. lividus*, *Forst.*, but the latter has not occurred with me in the Solway district.
- Laccobius sinuatus*, *Mots.*—**Kirkeudbright**, Colvend, Rockcliffe, R. Ken, Kells.
- L. nigriceps*, *Thoms.*—**Kirkeudbright**, New Barean L., Colvend R. Nith, R. Urr. Neither this species nor *L. sinuatus* is common in the district as far as my experience goes.
- L. alutaceus*, *Thoms.*—**Kirkeudbright**, fairly common.
- L. minutus*, *L.*—**Kirkeudbright**, **Wigtown**, R. Cree; perhaps commoner than *L. alutaceus*.
- L. bipunctatus*, *F.*—**Kirkeudbright**, Maxwelltown Loch (1), and one also in a pond in the district.
- Berosus signaticollis*, *Charp.*—**Dumfries**, Caerlaverock Salt Marsh (Lennon).
- [*B. luridus*, *L.*—**Dumfries**, Rev. W. Little.]?

- Limnebius truncatellus*, *Thoms.* — **Dumfries, Kirkeudbright, Wigtown.**
- Chætarthria seminulum*, *Herbst.* — (Sharp and Lennon.)
- Helophorus tuberculatus*, *Gyll.* — **Dumfries** district (Lennon), two specimens.
- H. porculus*, *Bedel.* — **Dumfries**, Kelton and Caerlaverock Salt Marshes (Lennon).
- H. nubilus*, *F.* — **Dumfries**, Kelton and Caerlaverock Salt Marshes (Lennon).
- H. aquaticus*, *L.* — **Dumfries, Kirkeudbright**; a smaller form, presumably var. *æqualis*, Thoms., although I cannot definitely separate it from the type, is also common, especially on salt marshes.
- H. viridicollis*, *Steph.* (= *æneipennis*, *Thoms.*). — **Dumfries, Kirkeudbright**; *H. strigifrons*, Thoms., I have taken in Renfrewshire. It possibly occurs in the Solway district; but until the appearance of Mr. Edwards's paper on the 'British Helophori' ("EMM," ser. 2. xix. Oct. 1908), I had not attempted to distinguish it. I am not yet clear in my own mind that it is worthy of specific distinction.
- H. dorsalis*, *Marsh* (= *Mulsanti*, *Rye*). — **Dumfries**, Kelton; **Kirkeudbright**, Preston Merse.
- H. brevipalpis*, *Bedel.* — **Dumfries, Kirkeudbright, Wigtown** (J. G. Gordon).
- H. arvernicus*, *Muls.* — **Dumfries**, R. Lochar; **Kirkeudbright**, Cargen Burn.
- Hydrochus brevis*, *Herbst.* — **Kirkeudbright**, Maxwelltown L. (Lennon).
- H. angustatus*, *Germ.* — **Kirkeudbright**, Maxwelltown L.; one only, (Lennon).
- Henicocerus exsculptus*, *Germ.* — **Kirkeudbright**, R. Nith, R. Ken; not common.
- Octhebius marinus*, *Payk.* — **Dumfries**, Kelton and Caerlaverock Salt Marshes; **Kirkeudbright**, Preston Merse.
- O. pygmæus*, *F.* — **Kirkeudbright**, Dalbeattie, Castle - Douglas; scarce.
- O. bicolor*, *Germ.* — **Dumfries**, Kelton; not common.
- O. rufimarginatus*, *Steph.* — **Kirkeudbright**, Cargen Burn (one specimen only); Lennon (MS. list) speaks of it as very rare, and there is only one specimen in his Collection.
- O. auriculatus*, *Rey.* — **Dumfries**, Kelton, a few specimens, but it has not been searched for!

- O. lejolisii*, *Rey. and Muls.*—**Kirkeudbright**, Douglas Hall, but probably to be found at every suitable habitat.
- Hydraena testacea*, *Curt.*—**Kirkeudbright**, R. Cairn near Irongray (Sharp and Lennon).
- H. riparia*, *Kug.*—**Dumfries, Kirkeudbright, Wigtown**; common in grassy ponds and grassy edges of rivers.
- H. brittzeni*, *Joy.*—**Kirkeudbright**, Cargen Burn, very common in March 1907 on some flooded meadow land. **Wigtown**, R. Cree, one only. These are the only times I have found the species in the Solway district, but I have taken it in Ayrshire and Renfrewshire.
- H. longior*, *Rey.* } Dr. Sharp records *H. angusta* for the Solway
H. angustata, *Sturm.* } district. It seems doubtful whether that species really occurs in Britain, the records apparently referring to *H. longior* (E. A. Newberry, "EMM." ser. 2. xviii. 172-3, 1907).
- H. gracilis*, *Germ.*—**Kirkeudbright**; common in almost all the small streams I examined.
- H. atricapilla*, *Wat.*—**Kirkeudbright**, R. Cairn, near Lincluden (Lennon).
- H. pygmaea*, *Wat.*—Solway (Sharp).
- H. pulchella*, *Germ.*—**Kirkeudbright**, R. Nith. Lennon also mentions having taken one specimen in the Glen Burn (Cargen Burn). Scarce.
- Cyclonotum orbiculare*, *F.*—**Dumfries**, "abundant in flood-refuse" (Lennon); **Kirkeudbright**, Maxwelltown Loch.

In the foregoing list I have endeavoured in mentioning localities to use only names to be found on the map, and the map which I have followed is Bartholomew's "half-inch." Lennon's reference to the "Glen-mill burn" refers to the Cargen Burn or Cargen Water, and if I have incidentally mentioned "Lotus Loch," it is the same as Loch Arthur. "Racks Moss" is that part of the Lochar Moss near Racks Railway Station, an easily approached part of the moss, and usually very productive. Similarly, "Bankend" refers to that part of the Lochar Moss near the village.

I have already mentioned how the personal element affects the results of any collector, so that my remarks as to the commonness or rarity of a species are quite probably unjustifiable. In such a district as the south-west corner of

Scotland most of the water-collecting is carried on either on peat mosses or about lochs, so that localities for "pond" species are not frequent. Thus *Hydroporus lineatus*, for instance, is a rarity compared to what it is in East Norfolk, but it probably occurred in every "pond" habitat I examined.

One of the best collecting areas in the district, to which Lennon introduced me many years ago, is the Maxwelltown Loch. The loch itself is now greatly reduced, and was never large; but there is some excellent marshy ground, and one or two mossy shallow ditches. In this small area I found 38 species, and several of Lennon's records also refer to this place.

Kirkcudbright, with about 110 species, has at present by far the fullest Scottish list of Water-beetles, Dumfries coming next with about 65 species; but the possibilities of the Scottish counties have, as yet, scarcely been tried. During four days last September I took 62 species in Forfarshire. The Edinburgh List, so far as I know it, contains 61 species, but such names as *Agabus Sturmii* and *chalconotus*, *Colymbetes fuscus*, *Dytiscus*, *Philydrus*, *Laccobius*, *Limnebius truncatellus*, *Helophorus aquaticus* and *brevipalpis*, and *Hydræna* are at present absent from it. Fifeshire, where I had two days' collecting last autumn, totals 58 species; and these are, I believe, the best Scottish Lists, so that there is promise of better things for those who choose to investigate.

I must take this opportunity of thanking a large number of Entomologists who, by sending me their lists of species collected in various parts of Great Britain and Ireland, have greatly assisted me in my work on the distribution of the British and Irish Water-beetles. It is due to their kindness that I have been able to discuss with some fulness the distribution of some of the more interesting species mentioned in this paper.

I must also thank Mr. Eagle Clarke, the Keeper of the Natural History Department of the Royal Scottish Museum, Edinburgh, for allowing me to use Lennon's MS. List which, with the collection, is now under his charge, and for sending me the whole of the Lennon Water-beetles to examine; and I must thank Mr. Percy Grimshaw for sending

me a copy of that part of Lennon's Register which referred to the Water-beetles.

I hope that the discovery of the Lusitanian element in the fauna of the Solway district may stimulate other entomologists to explore other districts, and I shall be greatly indebted to any who do if they will send me their lists of species.

SUPPLEMENTARY NOTE.

Since the above paper was written I have made one or two further observations on the local fauna.

Agabus uliginosus, *L.*, should be added to the Kirkcudbrightshire list. I have found it in some numbers on the Preston Merse, Southwick, in company with the halophyll species. This definitely confirms the older record of the species for the Solway district.

Octhebius auriculatus, *Rey.*, can also be added to the Kirkcudbrightshire list. I think the species is probably more common than the records indicate, but it is very difficult to find. Both at Kelton and at Southwick I can only take it at the time of the highest spring tides when parts of the merse are flooded. It seems to live in the fine silt amongst the roots of the plants, and is submerged only at the times of the highest spring tides. I am told that in Kent it is found by grubbing at the roots of the sea-lavender (*Statice*), but I have not yet been able to discover it in such a situation in the Solway district.

Hydræna atricapilla, *Wat.*, has turned up in Dumfriesshire, but seems to be very rare, although this scarcity may be due to the fact that I have not yet hit upon its proper habitat.

I have been expecting to find *Paracymus nigro-æneus*, *F.*, in the Solway district, but have so far failed. The species occurs as far north as Argyll main and Ebudes mid, so it should surely turn up in the more southern counties of Scotland.

LIST OF PAPERS DEALING WITH THE "SOLWAY" AQUATIC COLEOPTERA

1. 'Localities of Scottish Coleoptera,' Rev. W. Little, "Mag. of Zoology and Botany," ii. 232-7, 1838.
2. 'Coleoptera of Scotland,' Andrew Murray, 1853.
3. 'Occurrence of *Agabus Solieri* near Dumfries and Clova,' W. R. M'Nab, "EMM.," iv. 283, 1867-68.

4. 'Notes on Coleoptera in the South of Scotland,' D. Sharp, "EMM.," iv. 107-109, 1867-68.
5. 'Coleoptera of Scotland,' David Sharp, "Scott. Nat.," i.-iv., 1871-78.
6. 'List of Solway Beetles' in "Local Parish Histories and New Statistical Account," by Rev. Dr. Weir [List probably obtained from Lennon], "Dumfries Courier," Sept. 22, 1876.
7. 'The Rarer Coleoptera of the Dumfries District,' W. Lennon, "Trans. Dumfries and Galloway Nat. Hist. and Antiq. Soc.," pp. 74-9, 1876-78.
8. 'Notes on Rare Beetles, No. II.,' W. Lennon, *ibid.*, pp. 77-8, 1878-80.
9. '*Helophorus tuberculatus* in Scotland,' W. Lennon, "EMM.," xvi. 134, 1879-80.
10. 'Some Additions to Scottish Coleoptera,' etc. etc., W. Lennon and W. D. Douglas, "Ann. Scott. Nat. Hist.," April 1892.
11. 'Coleoptera near Dumfries,' W. Lennon, "EMM.," xxxi. (ser. 2. vi.) 174, 1895.
12. 'Coleoptera in Mid-Solway,' MS. List of W. Lennon, now in the Natural History Department of the Royal Scottish Museum, Edinburgh.
13. 'Notes on Coleoptera taken in Wigtownshire,' J. G. Gordon, "Ent. Rec.," xv. 46-9, 1903.
14. 'Notes on Wigtownshire Coleoptera,' J. G. Gordon, "Ent. Rec.," xvi. 78, 1904.

ON SOME SCOTTISH SIPHONAPTERA.

II.

By JAMES WATERSTON, B.Sc., B.D.

SINCE October 1906 I have had few opportunities of securing Siphonaptera, nevertheless, chiefly through the kindness of one or two friends, a large number of fleas have come into my hands. In recording these now, I should like to tender my best thanks to all who have assisted by sending specimens.

As before also I have to thank heartily the Hon. N. C. Rothschild, M.A., for the trouble he has ungrudgingly taken in identifying my specimens.

In the following short list I have given the county when first mentioning a locality, but not later. In other cases if no county is named, the locality is in Midlothian. All the species from *gallinæ* to *borealis* have been taken from the nests of various passerines. To avoid repetition only the host's name is indicated.

What proportion of the notices here given constitute first "records" for particular districts I cannot say. As yet little

has been done in this group in Scotland. Mr. Evans has published in the "Annals" (July 1904 to October 1906) two short papers and a note dealing exclusively with the Forth areas. There are also other scattered records, particularly in Mr. Rothschild's papers.

PULEX IRRITANS, *L.*—♀, Dennistoun Public Library, Glasgow, 22, x. '06 (R. G.).

CERATOPHYLLUS FASCIATUS, *Bosc.*—3 ♂♂, on *M. sylvaticus-fridariensis*. Fair Isle, Shetland, ix. '06. N. B. Kinnear. ♂ and 14 ♀♀ on *M. decumanus*, Edinburgh, 4, x. '06. D. MacRae.

C. PENICILLIGER, *Grube.*—13 ♂♂ and 32 ♀♀ on *M. orcadensis*, nr. Stromness, Orkneys, summer '07. Geo. Ellison.

C. WALKERI, *Rothsch.*—2 ♀♀ on *M. amphibius*, Whiteadder, Abbey-St.-Bathans, Berwickshire, 16, v. '08. J. Lawrence.

C. GALLINÆ, *Schrk.*—From the following nests:—♀, *Ruticilla phænicurus*, Gorebridge, 17, vii. '06. This example was bred months later. 2 ♀♀, *T. merula*, nr. Colinton, 15, iv. '07. ♀, *Sturnus vulgaris*, Aberdour, Fifeshire, 20, iv. '07. ♂, *Accentor modularis*, Quixwood, Grant's House, Berwickshire, 14, v. '07. ♂ and ♀, *Phasianus colchicus*, Cowdenbeath, Fifeshire, 10, vi. '07. ♀, *Anthus pratensis*, Cowdenbeath, 10, vi. '07. ♀, *T. merula*, Edinburgh, 12, v. '08. 5 ♀♀, *S. vulgaris*, Edinburgh, 12, v. '08. Common at Kennetpans (nr. Kincardine-on-Forth, Clackmannanshire), 8-10, viii. '08. *M. lugubris*, *P. domesticus*, *P. cœrulens*. A ♀ also occurred among dead leaves in the orchard at the same place. Abundant, *P. domesticus*, Wilberlea, St. Andrews, Fifeshire, 18, viii. '08. *P. domesticus*, Coldingham, Berwickshire, 25, ix. '08. 200-300 collected by Mr. J. F. Cormack.

C. FRINGILLÆ, *Wlk.*—A correction. In "A.S.N.H.," 1906, p. 213, there were recorded under this name several specimens from Colinton and a single ♂ taken at Gorebridge. Later these fleas seemed referable rather to *C. gallinæ*, and, after they had been re-examined at Tring, this change was confirmed.

C. GAREI, *Rothsch.*—♂ and 3 ♀♀, *Gallinula chloropus*, on the Eye, nr. Grant's House, 14, v. '07.

C. FARRENI, *Rothsch.*—9 ♂♂, 29 ♀♀, *C. urbica*, Kennetpans, nr. Kincardine-on-Forth, 10, viii. '08. It is still abundant in its first Scottish locality nr. Coldingham, Mr. J. F. Cormack took over 70 there in August 1908. He was fortunate also in securing from the nests of *C. urbica*, of which he examined a large number recently flown, no fewer than 40 puparia and 2 imagines of *Stenopteryx hirundinus*, Leach.

- C. HIRUNDINUS, *Curt.*—♂ and 9 ♀ ♀, *C. urbica*, Kennetpans, 10, viii. '08. ♂ and 6 ♀ ♀, *C. urbica*, Coldingham, 25, ix. '08. J. F. Cormack.
- C. NEWSTEADI, *Rothsch.*—6 ♂ ♂ and 7 ♀ ♀, *T. merula*, Aberdour, 20, iv. '07. ♀, *C. aquaticus*, on the Eye, nr. Grant's House, 14, v. '07. ♀, *C. aquaticus*, Whiteadder, Abbey-St.-Bathans; ♀, *L. chloris*, *ibid.*, 14, v. '07. 2 ♂ ♂, 9 ♀ ♀ in all, taken from nests of *T. viscivorus*, *T. parvulus*, *M. lugubris*, nr. Loganlea waterfall, 25, v. '07, by R. Cochrane. Abundant, *Scolopax rusticula*, Aberdour, 25, v. '07, James Allan; also ♂ and 3 ♀ ♀, *P. colchicus*, *ibid.* 2 ♂ ♂ and ♀ ♀, *P. colchicus*, Cowdenbeath, 10, vi. '07. 2 ♀ ♀, *T. merula*, Edinburgh. 2 ♂ ♂, 3 ♀ ♀, *Accentor modularis*, 12, v. '08, *ibid.*
- C. BOREALIS, *Rothsch.*—(See "Ann. Scot. Nat. Hist.," 1908, p. 256-7.)
- CTENOPHTHALMUS AGYRTES, *Heller.*—♂ and ♀, *M. sylvaticus-fridariensis*, Fair Isle, ix. '06. N. B. Kinnear. ♂, *M. sylvaticus*, Windygates, Fifeshire, 27, x. '06 (N. B. K.). 11 ♂ ♂, 50 ♀ ♀, *M. orcadensis*, nr. Stromness, summer '07. G. Ellison. ♀, *M. amphibius*, Abbey-St.-Bathans, 16, v. '08. J. Lawrence. ♀, *Hypudæus glareolus*, Coldingham, 25, ix. 08. J. F. Cormack.
- HYSTRICHOPSYLLA TALPÆ, *Curt.*—♂ and 5 ♀ ♀, on *M. orcadensis*, nr. Stromness, Orkneys, summer '07. George Ellison.

This very interesting record brings the number of siphonapterous parasites on the Orkney Vole up to five. The others are *C. gallinæ*, *C. penicilliger*, *C. mustelæ*, and *C. agyrtes*.

It is too early yet to draw any general conclusions on distribution or the like from the collections made. One fact is, however, very noticeable—the preponderance of ♀ ♀ over ♂ ♂. I have notes of the sex of 1250 specimens of various species, in which the ♂ ♂ amount only to 30 per cent of the whole. [While collecting in Orkney Mr. Ellison was struck by the same fact. The difference was even more marked. In 112 examples (of 3 species) 25 were ♂ ♂.] As regards particular forms the percentage varies. In *C. Farreni* the sexes are more evenly balanced than in any species which I have taken in numbers. Nearly 40 per cent are ♂ ♂. *Gallinæ* and *Newsteadi* show rather more than 36 per cent and 29 per cent of ♂ ♂ respectively. I have the former from 18, the latter from 21, distinct hosts.

THE HIGH ALPINE FLORA OF BRITAIN.

BEING A LIST OF THE FLOWERING PLANTS AND
FERNS FOUND AT A THOUSAND METRES AND
UPWARDS ON THE MOUNTAINS OF THE BRITISH
ISLES, WITH AUTHENTIC REFERENCES AND CRITI-
CAL NOTES.

By FREDERIC N. WILLIAMS, F.L.S.

(Continued from p. 168.)

MONOCOTYLEDONS.

Fam. 28. JUNCACEÆ.

104. *Juncus biglumis*, L.—In wet places and by the sides of rills on micaceous rocks. Summit of Meall Ghaordie (John Stuart in Lightfoot, "Fl. Scotica," 1100),—its earliest record as a British plant (1777). "By the side of rivulets near the summit of Ben Lawers" (G. Don, Herb. Brit., fasc. i. n. 8, 1804). "Moist ground at very considerable heights on all sides of Ben Lawers" (R. Brown, 1794, in Herb. Brit.). In abundance on the north-east side of Beinn-dubh-Chraige, near Tyndrum (E. S. Marshall, 1888, in "Journ. Bot." 1889, p. 235),—at 1000 m.

105. *Juncus triglumis*, L.—Not uncommon in bare wet places on the mountains of the Breadalbane district, up to 1005 m. ("Fl. Perthsh." 298). It ascends to this level on Ben Lawers (G. C. Druce in "Journ. Bot." 1890, 44). Ascends to 1067 m. on Snowdon, in boggy alpine places (A. Bennett, ex "Ann. Scot. Nat. Hist." 1904, 196),—thus to a higher level than on the Scottish mountains.

106. *Juncus castaneus*, L.—On alpine bogs, very rare, on micaceous soil, near the summit of Ben Lawers (G. Don, 1794, and in fasc. iv. [1805]). "I have gathered it to the south, east, and west of the peak of Ben Lawers" (Syme, "Engl. Botany," x. 14 [1870]).

107. *Juncus trifidus*, L.—On alpine stony ridges and rock-ledges. First recorded in Ross-shire in 1777. "I found it upon the summits of the Highland mountains to the south of Little-Loch-Broom in Ross-shire" (Lightfoot, "Fl. Scotica," i. 184). This most probably refers to An Teallach, which is the most noticeable mountain in the locality indicated, and is considerably over 1000 m. It may also include Ben Dearg, which is not far off. Summit of Ben-na-Bourd: "on the sides and top of Ben Bourd, a high mountain about seven miles from Invercauld" (R. Brown, 1794, in Herb. Brit.). Summit

of Ben Macdhuì (Wm. Gardiner, 1845, in Herb. Brit.). Ben Lawers, at about 1000 m. (G. C. Druce, in "Ann. Scot. Nat. Hist." 1900, p. 231). Not unfrequent on the higher ridges of the Braemore hills, in Ross-shire, up to 1100 m. (G. C. Druce in "Ann. Scot. Nat. Hist." 1903, 172). It is found on Loch-na-gar from 732 m. to the summit (Dickie, 1868), and on the ridge of Ben Eay (G. C. Druce in "Trans. Proc. Bot. Soc. Edin." 1894, p. 160). On the table-top of Ben-na-Bourd, at 1130 m. (Watson, 1832, in Herb. Kew.), and on the summit (Watson, 1844).

108. *Juncus bulbosus*, L.—"I observed this plant in October 1804, by the side of a rivulet, near the summit of Ben Lawers, in a situation where the snow remains during the greater part of the year, and not far from the spot where I first discovered the *Juncus castaneus* in May 1794" (Don, fasc. iv. 1805). *J. supinus* (Don in Herb. Brit.).

Syn.—*J. supinus*, Moench.

109. *Luzula maxima*, Cand.—Summit of Carn Tual ("Cyb. Hib." ed. 2, 364).

110. *Luzula spicata*, Cand.—Summit of Ben Macdhuì (Watson, 1832, in Herb. Kew.; Wm. Gardiner, 1845, in Herb. Brit.). On alpine ridges and rock-ledges it ascends almost to the summit of Ben Lawers ("Fl. Perthsh." 300). Summit of Ben-na-Bourd (Watson, 1844).

111. *Luzula arcuata*, Wahlenb.—Earliest record "on the most stony and barren summits of Cairngorum, and others of the Grampian mountains" (Hook. ex Smith, "Engl. Fl." ii. 183 [1824]). "An inhabitant only of the highest of the Grampian mountains, as Cairngorum, Ben-y-mac-duich, and others of that granitic chain, growing upon the summits and amongst the comminuted rock, where scarcely any other plant can exist. . . . So severe is the climate at the elevation at which it grows (upwards of 4000 feet above the level of the sea), that it does not always come to perfection: and in the month of August 1830, owing to the unusual quantity of snow which fell during the summer months, scarcely a perfect blossom appeared to have been formed" (Sowerby and Hooker, "Engl. Bot. suppl." t. 2688, 1 April 1831). Upon the summits and shoulders of Ben Macdhuì and Loch-na-gar (Crombie, "Braemar," p. 60 [1861]). Summit of Ben Macdhuì (Watson, 1832, in Herb. Kew.; G. Don, 1812; Hooker, William Gardiner, 1845, in Herb. Brit.); also from the same mountain, but no height given (A. Croall, "Pl. of Braemar," 1854, n. 54, in Herb. Brit.). Cairngorm (J. Groves, 1884, in Herb. Brit.). Summit of Ben Avon, and near the summit of Loch-na-gar (Balfour, Mackay, ex Dickie, 171).

112. *Luzula campestris*, Cand., var. *multiflora*, Brand in Koch, "Syn. deutsch. schweiz. Fl." Aufl. 3, p. 2514 (Liefg. 16).

Syn.—*Juncus multiflorus*, Ehrhart, "Calam." n. 127, ex Hoffm., "Fl. Deutschl." i. 169 (1800); *Juncus erectus*, Pers., "Syn. Plant." i. 386 (1805); *Luzula multiflora*, Lejeune, "Fl. Spa," i. 169 (1811); *Juncus intermedius*, (non Host) Thuill., "Fl. env. Paris," ed. 2, i. 178 (1799).

Ascends to 1020 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 301).

113. *Luzula Sudetica*, Cand. (1815).—Head of Glen Callater, in Aberdeenshire (Syme). Alpine situations in the Breadalbane district (White). Of Syme's three varieties of *L. multiflora*, continental botanists place α and β under *L. campestris*, and keep up γ as the present plant.

Fam. 29. POTAMOGETONACEÆ.

114. *Potamogeton alpinus*, Balbis.—Ascends to 1020 m. in the Scottish Highlands (Ar. Bennett ex "Journ. Bot." 1907, 374).

Fam. 30. CYPERACEÆ.

115. *Eriophorum angustifolium*, Roth.—Ascends to about 1000 m. on the mountains of Breadalbane district ("Fl. Perthsh." 319). Ascends to 1100 m. on Sgorr-an-Dubh, on the west side of Glen Eunach (Prof. J. Trail, 1902).

116. *Carex leporina*, L.—North corrie of Loch-na-gar, at 1005 m., 1906 (Watson, "Bot. Exch. Club Rept." ii. 116 [1907]; Dickie, 66).

117. *Carex Lachenalii*, Schkuhr.—In the northern corrie of Loch-na-gar, at 1005 m. (E. S. Marshall and W. A. Shoolbred in "Journ. Bot." 1907, 295). Discovered on rocks in Loch-na-gar . . . 1836, by Mr. Dickie and Mr. Clark ("Engl. Bot. suppl." 2815 [1838]). It was found on the south-west corner of the table-top at about 1070 m. Syme ("Engl. Botany," x. 100) "found it [*C. lagopina*] in 1851 plentifully by the side of a small loch on the north side of the hill, the name of the loch being, I believe, Loch-an-ean."

118. *Carex canescens*, Lightf.—Ascends to 1037 m. on the mountains of the Breadalbane district (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 231); and to 1100 m. in Ross-shire (var. *fallax*, Asch. and Graebn.). See notes on this sedge in "Journ. Bot." 1908, 369. Lightfoot's "Fl. Scotica" is the correct authority.

119. *Carex echinata*, Murray (1770).—Summit of Beenkeragh (Hart in "Cyb. Hib." ed. 2, 397).

120. *Carex atrata*, L.—Ascends to 1130 m. on the Grampians of Aberdeenshire ("Cyb. Brit. Comp." 370). In the great corrie of Ben Avon, at about 1000 m. (E. S. Marshall and W. A. Shoolbred in "Journ. Bot." 1906, 160).

121. *Carex Halleri*, Gunn. (1772).—Ascends to 1000 m. on Ben Heasgarnich, in turfy places (G. C. Druce, 1906, as *C. alpina*, in "Bot. Exch. Club Rept." ii. 246 [1907]).

122. *Carex rigida*, Good.—On the very top of Snowdon (Hudson *ex* "Trans. Linn. Soc." ii. 193 [1792]). Mountain ridges and rock-ledges; ascending to the summits of all the hills on which it occurs, not infrequently forming a turf on the ridges ("Fl. Perthsh." 326). Ascends to the summit of Ben Lawers (White), of Ben Macdhui (Watson, 1832), of Ben-na-Bourd (Watson, 1844), and of Ben Ime (G. R. Lee in "Ann. Andersonian Nat. Soc." iii. 119 [1908]). Ascends to 1005 m. on Carn Tual ("Cyb. Hib." ed. 2, 400).

123. *Carex rariflora*, Smith (1813).—Ascends to 1070 m. on Loch-na-gar, in alpine bogs (E. S. Marshall, 1906, in Watson, "Bot. Exch. Club Rept." ii. 118).

124. *Carex vulgaris*, Fries (1842).—Bog near the top of Loch-na-gar (E. S. Marshall, 1906, in "Bot. Exch. Club Rept." ii. 246 [1907], *C. Goodenovii*). Ascends to 1000 m. on the mountains of the Breadalbane district ("Fl. Perthsh." 327).

125. *Carex saxatilis*, L.—Marshy places on the mountains of the Breadalbane district, up to 1070 m. ("Fl. Perthsh." 338, *C. pulla*). In a careful examination of the specimens of *C. saxatilis* in Herb. Linn. Mr. E. S. Marshall says in "Journ. Bot." 1907, p. 366:—"The type-sheet and a second unnamed sheet are both excellent *pulla*. The citation in "Spec. Plant." ed. 1, from "Fl. Lapp.," cannot be anything else; nor does the description (quoted from "Fl. Suec.") appear contradictory. Taking into account the specimen of *C. rigida* above mentioned, I am convinced that *C. saxatilis* ought to displace *C. pulla*, Good., rather than *C. rigida*, Good."

126. *Carex panicea*, L.—Ascends to 1130 m. on the Grampians of Aberdeenshire (Dickie *ex* F. B. White in "Scott. Nat." i. 119 [1871]).

127. *Carex vaginata*, Tausch.—On alpine rock-ledges and marshy places, up to 1150 m., on the Grampians of Aberdeenshire ("Cyb. Brit. Comp." 374). In the mountain form "the leaves are rather less glaucous; the glumes darker, with the dorsal green stripe not broader than the midrib and the scarious margins very narrow; and the fruit more or less tinged with purplish-brown" (Syme, "Engl. Botany, x. 134). At 1152 m. on Cairn Toul (Prof. J. Trail, 1902).

128. *Carex pilulifera*, L.—On alpine pastures ascends to 1005 m. in the Scottish Highlands ("Cyb. Brit. Comp." 377),—but not so high in Perthshire (see "Fl. Perthsh." 333).

Var. *longibracteata*, Lange "Handb. Dansk. Fl." 694 (1864).—Found up to 1067 m. on Ben Avon (E. S. Marshall and W. A. Shoolbred, 1905, in "Journ. Bot." 1906, 160). This plant is not identical with var. *Leesii*, Ridley, according to Mr. Druce, though Lange himself said he could see no difference between the two. Lees's specimen in Herb. Brit. does not seem readily separable from the Danish plant.

129. *Carex binervis*, Smith.—First recorded by James Beattie as "very common on the driest moors about Aberdeen." Ascends to 1000 m. on the Grampians of Aberdeenshire (Hooker, f.). The blackish-fruited form frequent in mountain localities (the species varies greatly) should most probably be referred to var. *alpina*, Drejer, "Rev. Crit. Car." 474 (1841). Descends to sea-level in Cork.

[In ed. 9 of Babington's "Manual," p. 455, *C. rupestris*, Bellardi, is stated to occur on lofty mountains. As far as I know, however, the highest level reached by the plant is only 793 m., on Ben Heasgarnich (White). *C. rariflora*, Smith, is stated to have been discovered by Don "among the mountains of Clova, Angus, near the limits of perpetual snow." As no point on the Clova hills is as high as 1000 m., and much less reaches "the limits of perpetual snow," an entirely unknown phenomenon on any part of the Grampian Mountains, more recent and confirmatory evidence is necessary before accepting this record.]

Fam. 31. GRAMINACEÆ.

130. *Nardus stricta*, L.—Ascends to 1005 m. on dry pasture in Aberdeenshire (Watson). Descends to sea-level in Kerry.

131. *Festuca ovina*, L.—Summit of Ben Macdhui (Watson, 1832), and of Ben-na-Bourd (Watson, 1844). "On the ledges of the highest rock of Snowdon" (Banks, 1773, in Herb. Brit.). Near the top of Ben Lawers (G. C. Druce in "Ann. Scot. Nat. Hist." 1900, 235). Summit of Ben Ime (J. R. Lee in "Ann. Andersonian Nat. Soc." iii. 121 [1908]). Summit of Carn Tual ("Cyb. Hib." ed. 2, 429). Descends to sea-level in Cork.

Var. *duriuscula* (L.), Hackel.—Ascends to the summit of Beenkeragh (Hart, 1881, in "Proc. Roy. Irish Acad." 1882, p. 578).

132. *Festuca rubra*, var. *arenaria* (Retz), Fries, "Fl. Halland." 28 (1817).—Ascends to 1065 m. on the mountains of the Breadalbane district (MacVicar in "Ann. Scot. Nat. Hist." 1905, 173).

Var. *grandiflora*, f. *alpina*, Hackel.—Ben More (E. S. Marshall).

133. *Poa annua*, L.—Found from the base up to the very top of Ben Lawers ("Fl. Perthsh." 351). Descends to sea-level in Ireland.

134. *Poa alpina*, L.—On alpine rock-ledges near the top of Ben Lawers ("Fl. Perthsh." 352; Hooker, Carroll, 1864, in Herb. Brit.). Ascends to 1070 m. in Aberdeenshire (Dickie, 206). Loch-na-gar (A. Croall, 1854, n. 161 in Herb. Brit.). "On the ledges of rocks near the top of the highest part of Snowdon" (Banks, 1773, in Herb. Brit.). Common on the higher mountains of the Scottish Highlands. Ben Lawers (Mackay in Herb. Smith). Descends to 440 m. near Annacoona, Sligo.

Var. *Lapponium*, Læstad.—Perthshire (P. Ewing, *ex* "Fl. Perthsh." 390). See also A. Bennett in "Scott. Nat." 1889, 103.

135. *Poa laxa*, Haenke (1791).—Rocks on the Grampians of Aberdeenshire and Inverness-shire up to 1100 m. (Hooker f., "Stud. Fl. Brit. Isl." ed. 3, 493). First found on Ben Nevis (J. T. Mackay, *ex* Smith, "Fl. Britannica," 101 [1800], *Poa flexuosa*).

136. *Poa stricta*, Lindeb. (1856).—First recorded on Loch-na-gar (Syme, "Engl. Botany," xi. [1872] 116).

137. *Poa glauca*, Vahl (1790).—Ascends to 1000 m. on rocky ledges in Aberdeenshire and Perthshire (Watson, Hooker, f., White). Descends to 120 m. near Ben Lawers Inn (G. C. Druce, *ex* "Fl. Perthsh." 352).

(*To be continued.*)

EUPHRASIA AND RHINANTHUS.

By WILLIAM H. BEEBY, F.L.S.

Euphrasia.—In Mr. Marshall's note (*ante*, p. 176) he observes, "I believe that it is safer to follow Wettstein and Townsend in regarding *E. scottica* as distinct." Doubtless it was so when Wettstein's Monograph was published in 1896, but we cannot afford to ignore all the subsequent developments, although Mr. Marshall does not refer to them. In 1896 Wettstein wrote, when comparing *E. scottica* and *E. minima* ("Mon." p. 171), "The sole distinction that I can see lies in the length and form of the capsule; in *E. scottica* it is shorter than, or at most as long as, the calyx, while in *E. minima*, when mature, it distinctly overtops the calyx." Commenting on this, Townsend wrote ("Journ. of Bot.," 1897,

p. 426), "It appears that these relative proportions in *E. scottica* are not constant," a statement easy to confirm by anyone who possesses a good series of specimens. (It may be noted here that Mr. Hiern ("Journ. of Bot.," 1909, p. 170) describes the capsule of the yellow-flowered Exmoor *E. minima* as "equalling or a little shorter than the calyx," and figures it as being a little shorter!) In lieu of the discarded character, Townsend (*l.c.*) substitutes another, adding "a marked distinction seems to lie in the form of the upper leaves and bracts of *E. scottica*, which are narrower than those of *E. minima* and have a cuneate base. *E. scottica* also seems to prefer decidedly wetter situations." The new character, however, is no more trustworthy than the old one, and was moreover stillborn, being refuted by anticipation in Wettstein's plate 4, figs. 225-54, which show the leaves or bracts of *E. minima* as having sometimes quite truncate, sometimes decidedly cuneate bases; in particular the bracts, figs. 242-3, are much more markedly cuneate even than those of *E. scottica*, as shown in Townsend's figures (*l.c.* plate 379, figs. B. 1-7), said to be copied from Wettstein's Monograph, but which I fail to find there. In Shetland, according to the determinations of Wettstein or Townsend, or both, *E. scottica* occurs scattered all over the heather moor, as often as not on the ordinary dry peat and frequently where no *Carices* are visible; as well as on dry grassy slopes. But I think it is more *obvious* in the wetter spots, because it is there less crowded by other plants; whereas when growing among thick heather it is not so readily seen, and does not so easily form dense colonies, except here and there where there are open green spots. There only remains to be considered the form of capsule, and I find that that of the Shetland plant is usually rather more oblong than that of *E. minima* as figured by Wettstein; but the shape is somewhat variable, as it is in the Continental plant, and I have Swiss specimens bearing capsules which agree very well with some of the Shetland examples.

Notwithstanding that the plant has gradually been stripped of its characters, Mr. Marshall continues to speak of "characteristic *E. scottica*"; but it does not appear in what sense he wishes that term to be understood.

With regard to the question of habit and development. In *Euphrasia* these are easily affected by a slight change in the nature of the habitat ; and until it has been shown that any variation in development is innate to the plant, and not merely a temporary state induced by an altered environment, it is futile to put it forward as a distinguishing character.

Euphrasia borealis is widely distributed and pretty common in Shetland. The normal state affects lowland pastures and is a rather large-flowered, moderately branched plant, similar to Townsend's plate (" Journ. of Bot.," 1897, fig. 374). When, however, it gets a little way up the lower hill slopes into drier and more exposed situations, its aspect is entirely changed. It becomes a dwarf (3-7 cm.), densely bushy, much branched plant with smaller flowers. On the other hand, the far less common state sometimes found in very wet peat bogs shows the opposite extreme. Here we get a plant which reaches a height of 32 cm. with a stem often quite simple or with but one pair of short branches placed low down, or more rarely with two or three pairs. The flowers are perhaps the largest of all, the lower lip measuring sometimes as much as 1 cm. in length.

Do these three phases represent true varieties or species? Or are they merely the temporary effect of changed environment? I do not know, nor is it possible to find out except by making careful experiment and growing the three plants under like conditions. But it is right to treat them simply as states, until the contrary has been proved, rather than adopt the practice of first describing your variety at all hazards, and leaving it to others to find out whether it is really distinct or not, if and when they can.

Although Prof. von Wettstein made many valuable cultural experiments, something still remains to be done with regard to the British-born names. A few experiments carefully conducted on right lines would put us in possession of facts in place of opinions. The experiments most needed are the following :—(1) To grow the disputed forms say *E. minima*, *E. scottica*, and *E. foulaensis* side by side under equal conditions, which of course involves growing them all on the same host-plant ; and (2) to take the seeds from a plant of either *E. minima* or *E. scottica* and sow half of them

on Carices and half on Gramina. The result would indicate what further cultures might be necessary.

In referring to another dubious plant, Mr. Marshall speaks of it as differing from *E. foulaensis*, among other ways, in having flowers of a "beautiful violet-blue." But this is not a difference either from *E. foulaensis* or *E. scottica*; it is the characteristic colour of the original *E. foulensis*, though I have since learnt that this intense violet-blue is the predominating colour in the *minimæ* in Shetland when growing on the peat, whether the group is represented by one species or more; just as pale-flowered forms predominate on the dry grassy slopes. But neither colour is exclusively confined to either formation.

In my last Shetland paper (p. 106) I wrote that I was "strongly disposed to accept" Ostenfeld's conclusions regarding these several plants. That remark was the result of general impressions derived from many observations; but the further research and examination of specimens which this note has entailed compel me to somewhat modify that remark and to say that excluding opinions founded on undefined "characteristic" specimens, etc., I think that the bulk of the evidence at present adducible favours Dr. Ostenfeld's view, and that his arrangement can only be assailed by actual proof obtained by means of the necessary cultural experiments. I am not at all confident that the results would confirm these views; but the cultures are not suggested with the object of confirming the views of one rather than another, but in the hope that we may learn from them some facts which will enable us to estimate correctly the relative positions of these plants.

Rhinanthus.—Mr. Marshall writes: "*R. stenophyllus* is considered by Mr. Beeby to be an 'autumnal' variety of *R. minor*." Well, really, in so characterising the plant, I was practically quoting from Mr. Marshall's own article "On the British Forms of *Rhinanthus*," in which he cites Dr. von Sterneck as saying that *R. stenophyllus* "represents the typical autumn form of *R. minor*"! (Sterneck, see E. S. Marshall in "Journ. of Bot.," 1903, p. 296).



CAREX HELVOLA, BLYTT, ON BEN LAWERS.

By G. CLARIDGE DRUCE, M.A., F.L.S.

I WAS afraid the statement made by the Rev. E. S. Marshall in "Journ. Bot." p. 108, although quite accurate, might lead to misunderstanding; and this has been the case (see "Ann. Scot. Nat. Hist." p. 188).

Mr. Marshall says: "I think the Ben Lawers plant, found by Mr. Druce in 1897, and issued as *C. helvola*, Blytt, var., is this hybrid [*C. canescens* \times *echinata*] . . . that was my first impression. . . . The *canescens* parent in this case would be *fallax*" [sic]. But this only refers to one special gathering of *C. helvola*, which as it did not agree with those previously found, I distinguished as "var." It must not be assumed, therefore, that all the Breadalbane *C. helvola* is the hybrid suggested by Mr. Marshall.

It may be well to restate the history of *C. helvola*, Blytt, as a Perthshire plant. In 1895 the Rev. W. O. Wait, a well-known bryologist, told he had recently seen *C. lagopina* on Ben Lawers. Unfortunately he had no specimen; but in 1896 he again, with Mr. N. V. Sidgwick, visited the locality, and brought me some very immature specimens collected at the end of June. They were, however, sufficiently developed to enable me to say they were not *lagopina*; and I was at first inclined to refer them to montane *canescens*, but subsequent dissection led me to believe they were nearer *helvola*. Dr. Lange of Copenhagen, to whom it was submitted, thought it must be *macilenta*, Fries ("Fl. Danica," Supp. iii. t. 168). Not being content with this determination, I sent him another specimen, when he replied: "The young [plants] of *C. canescens* are very difficult to decide; there is little difference between *C. canescens*, *C. macilenta*, and *C. helvola*. Your specimen is intermediate between the two latter, possibly sooner the *C. helvola*." As there was still doubt, I deferred publication until I had obtained further material. In August 1897 I went to Lawers and found the plant in Mr. Wait's exact locality in some plenty, over a limited area, about 3400 feet altitude; but, the season being backward, the specimens were still immature. A

fresh specimen was sent to Mr. Arth. Bennett, who replied "he thought I had got hold of the real thing," i.e. *C. helvola*. Dr. Christ of Basle, a well-known authority on the Carices, reported "the Scotch specimen [from Lawers] is, no doubt, the true *C. helvola*, identical with plants of Finland, Norway, and Greenland." Prof. Blytt of Christiania, son of the discoverer and namer of *C. helvola*, said: "I think you may name it *C. helvola*; it is not quite like the most typical form, but it is very like specimens collected by me in 1867 which I had determined as *C. helvola*." The Pfarrer Kükenthal, who has written the elaborate and scholarly 'Monograph of Carices' for the "Pflanzenreich," named it without any expression of doubt *C. helvola*, Blytt; and under that plant in his "Monograph" he gives my specimen (Ref. No. 22,966) gathered in 1889 from Ben Lawers, marking it with (!) signifying he had seen the specimen, as is the case with my Loch-na-gar plants. The above are my authorities, and warrant me in recording *C. helvola*, Blytt, from Ben Lawers, and including it in my "British List"; and Kükenthal also marks "Forfar!" the three counties cited for it in my "List."

Now for my *C. helvola*, Blytt, var. I visited Ben Lawers in 1898 and 1899, and collected more specimens, looking out especially for variations. One gathering (Ref. No. 1237) was distributed through the "Exchange Club" in 1898. This differed somewhat from *C. helvola*, therefore I put "var." In the specimens which I dissected I could see no evidence of *echinata*, which the Rev. E. F. Linton and Rev. E. S. Marshall suggested; but subsequently in going over some duplicates I saw that in one or two cases the *perigynia* had a longer beak. This was more evident in specimens collected in 1899, which I also sent to Kükenthal as "? *canescens* × *echinata*." On these he remarked, "Nearer *canescens* than the specimen sent last year. The spikelets are more elliptic than oval, and somewhat longer beaked than in *canescens*, otherwise the difference from *canescens*, var. *dubia*, is very slight." On the faith of my specimens from Lawers, Kükenthal in his "Monograph," p. 250, cites under *canescens* × *stellulata* = *C. biharica*, Simonk, "Ben Lawers, G. C. Druce!". Other specimens he names (*loc. cit.* p. 251)

forma *super-canescens*, Kük. = *C. tetrastachya*, Traunst. = *C. helvola*, Druce, var. In my "List," which was published before I saw the "Monograph," it appears as *echinata* × *canescens* = *C. tetrastachya*, Traunst. At the time we gathered it *C. echinata* was still flowering; *C. canescens*, as its var., was much over.

The locality has since been visited by two or three botanists; but the plant sent to me by them has been *C. canescens*, L., var. *robustior*, Anders., which I saw somewhat higher up on the hill, but in the same drainage area. Therefore if *C. echinata* is crossed with *canescens* it would be rather with the var. *robustior*, which is in the locality, than with var. *fallax*, which is not recorded for that vicinity. But the point is this: the small plateau on which *C. helvola* grew yielded one year plants which Kükenthal named, without doubt, *C. helvola*; another year the same place also yielded some doubtfully referred to *canescens* × *echinata*. In the following year plants nearer *canescens* were obtained, and I saw *canescens*, var. *robustior*, too there. Since then I am told the var. *robustior* has alone been noticed.

Can it be that a plant at first distinguished as *helvola* has been recrossed with one of its parents until the prepotent form has subjugated the weaker?

Such a case happened at Oxford with the *Linaria vulgaris* × *repens*. The advent of the alien *repens* to the native *vulgaris* led to the production of hybrids, the first year about intermediate, the second in almost all stages between, and in numbers much exceeding either of, the parents; then the gradual assertion of the native species, aided, perhaps, by the chalk-rubble being gradually covered over with other soil, till now only here and there a lingering hybrid can be found. But *L. vulgaris* does not remain quite as it was, for although no trace of the striae, or colour of *repens*, could be observed in it, yet the plant, instead of being fairly constant, shows variations in quite unexpected ways—in the width of the leaves, in the shape and direction of the spur, in the colouring of the flowers, etc.

Of course we must have more definite evidence as to the actual disappearance of *C. helvola* and *C. tetrastachya* (both of which Kükenthal named) from the precise locality on

Lawers. It must also be borne in mind that the two assumed parents of the latter plant are also associated on Loch-na-gar, where *lagopina* (*Lachenalii*) grows. This I gathered in 1899. To hint at want of faith in the correctness of the suggested names of the parents of some critical forms would (in these days when any plant off type is named, by some botanists, a hybrid) put oneself outside the scientific pale. In some cases, however, much faith is required—faith, we are told, is an evidence of things not seen.

NEW AND RARE MOSSES FROM THE WEST OF SCOTLAND.

By JAMES STIRTON, M.D.

(Continued from p. 173.)

Mollia subbifaria, n.sp.—In dense, somewhat extended, convex tufts, of a bright green colour above, white in a narrow belt just below, pale downwards to the base or with slight dashes of red throughout; stems pale from a half to an inch in length, simple or dichotomously divided, slender; leaves rather closely set and clasping somewhat, showing almost always a *bifarious* disposition around the stem, long, nearly oblong, with a blunt rounded summit where the pagina of each side ends abruptly and roundly on the nerve or in many cases quite round and semicircular, acumen short and triangular in outline (length .025-.045 mm.) in composition as in the others, but shewing only from one to five longish cells in a clear homogeneous matrix, or wanting entirely, when the apex is quite round and often somewhat cucullate; nerve pale, latit. near base, .07-.1 mm., tapering and ending in the apex or ceasing below it, smooth and prominent behind; cells at base hyaline, large, occupying nearly the *lower half* of leaf, oblong attached, .065-.09 by .01-.014 mm. sloping up towards margin as in *M. tortuosa*, upper cells hexagonal or merely roundish, mostly with clear narrow interspaces, .009-.013 mm., in longer diam. In 1907, near the sea at Keppoch close to Arisaig.

Since the discovery of this moss I have considerable

doubts whether *M. limosa*, described in the "Annals" for April 1905, should be retained as a species and not placed as a variety under it. However as the peculiar rosette-like manner of growth in *M. limosa* (not present in this), and as the small size appears constant in the various places where it has been found, I meanwhile retain it as such.

As tending to encourage a more critical examination of the areolation, I shall describe another moss which has evident affinities to *Leptotrichum flexicaule*, yet differs from it in several obvious particulars as well as in the areolation.

Leptotrichum cyclophyllum, n.sp.—In rather lax tufts from two to three inches in height, deep green above with a rather narrow pale or pale yellow band immediately underneath, thereafter fuscous to the base, only slightly red-radiculose in the lower part; stems slender, simple or sparingly dichotomously divided, of a deep red colour, closely flexuose or rather zigzagging, where the divisions are only about half the length of those of *L. flexicaule* and more pronounced; leaves secund and for the greater part arcuato-incurved in the *same direction* throughout, expanded at the base in a triangular rather than in a semi-elliptical form, narrowing upwards rather suddenly, longly subulate, margin plane, entire at and near base but deeply and sharply as well as closely serrated at apex, more distantly but as deeply serrated on margin in the upper third, thence serratures become gradually shallower downwards, upper serratures have a perpendicular height from .009-.013 mm.; nerve near base, broad, flat, .075-.1 mm., tapering and becoming predominant, although a single row of narrowing paginal cells on each side seen far up, .025-.034 by .003 mm., cells at central base large, oblong with bright transparent nuclei, .045-.07 by .007-.01 mm., outwards, cells narrower to margin; upper cells are nearly as long but much narrower, viz. .04-.06 by .003-.005 mm.

On the ground beneath birch trees, behind Onich, 1908.

Four or five capsules of the previous year were secured but became lost in the vasculum.

The wide differences in the areolation of these two mosses are sufficient to keep them apart while the red colour

and short zigzagging of the stems as well as the deep, sharp serratures serve to widen this distance.

Mollia terrena (Strn.), first found in Tarbert in Harris, and described in the "Annals" for July 1900, was detected in several places in the neighbourhood of Onich. The long broad acumen in this species, formed by the abruptly rounded narrowing of the long leaf to a fourth of its breadth below, is peculiar, almost unique. The length of this acumen varies from .4 to .7 mm. And its breadth near the middle from .07-.1 mm. or about one-fifth of its length. It tapers a little upwards but continues broad to the apex which, however, is often narrowed rather abruptly to a short point by a large, pointed, pellucid cell or by several such of smaller size and then slightly granular. The narrowing nerve penetrates this acumen nearly to its middle, but its breadth there is not more than one-tenth part of that of the acumen. The margin is plane, often undulating and crenulate, while the peculiar marginal serratures extending down to near the base, are also characteristic.

I am pleased at having another opportunity of describing what can only be reckoned a much greater departure than *Grimmia fuliginea* (described in the "Annals" for July 1908) from *Racomitrium heterostichum*. In this instance I consider the transition from *Racomitrium* to *Grimmia* as almost complete. The moss still retains the peculiar greyish colour of the former, but differs from it in almost every other particular—in the areolation, in the manner of ramifying, in the configuration of the dense tufts, etc.

Grimmia subaquila, n.sp.—In dense, convex, greyish, hoary tufts; stems rather slender, for much the greater part fastigiato-ramose in the upper half, but not infrequently, merely dichotomously divided or simple, about one inch long; leaves closely arranged around stem, flaccid but appressed in a dry state, spreading a little and straight when moistened, from a rounder, wider and somewhat clasping base, narrowly lanceolate, terminating in a bluntly spinulose hair, nearly a third the length of the leaf proper; nerve pale, narrow, latit. near base .04-.05 mm., tapering upwards to apex; margin reflexed or even recurved in lower half or a little more, breadth of reflexed portion at its widest, .025-.04 mm.,

narrowing upwards, plane and entire in upper half; cells at central base long, narrow, detached, hyaline, straight, not undulated, .045-.07 by .005-.7 mm., shorter outwards and in 7 to 10 perpendicular rows near and at margin oblong, often constricted in the middle, cells up from base for a short distance, dark opaque, constricted in the middle, .01-.014 mm., in longer diameter, those in upper two-thirds, quadrate, minute dark and opaque, .006-.01 mm. across; margin soon thickened from below by a single transverse terminal couple of cells, farther up two such couples, only rarely are three such couples seen.

At Loch-nan-Uamb, several miles to the east of Arisaig and near Prince Charlie's Cave; on stones covered with earth, by the Rev. J. A. M'Caskill of Onich, September 1908.

It is somewhat remarkable and tends to strengthen the theory of a change of type that occasionally, in the lower part of a leaf, instead of the long, narrow, smooth cells, a minute patch is seen consisting of what may be reckoned very minute cells so arranged that if certain little gaps were filled in, the appearance of deeply sinuose cells would be portrayed. In other words this affords a faint but interesting indication of its origin.

The next moss has been under observation for five years. I have waited for the purpose of finding it in a fertile condition, but hitherto in vain. It is allied to *Anæctangium compactum*, a true alpine plant. On the contrary this has only been found on the sea-shore.

Anæctangium marinum, n.sp. — In rather large, straggling, sparsely tomentose tufts, quite a contrast, in this respect, to the other; stems about an inch long, pale or yellowish, simple, dichotomously or not unfrequently fastigiate branched above; leaves crisped when dry, straight and nearly upright when moistened, narrowly ovate-lanceolate, acuminate, conduplicate, margin plane, very minutely papillose or nearly entire; nerve pale slender, latit. near base, .04-.05 mm., tapering and excurrent in a long, tapering sharp-pointed acumen, .07-.1 mm. long, smooth and prominent behind; cells at central base, oblong, separate, .018-.027 by .006-.9 mm., outwards smaller, and near and

at margin as those above, upper cells bluntly quadrate, dark, opaque, with 2 to 4 pellucid nuclei, narrowly separate, .007-.1 mm. across, a little smaller near apex. On schistose rocks. This moss has been found in several localities at considerable distances from one another, but all within what may be reckoned the same large basin, viz. Morar, Kentallen, Onich, Ardgour (M. C. Stirton), all on the shores of Loch Linnhe, an arm of the sea.

There is a remarkable variety of this moss in which the whole plant, except the year's growth of about one-eighth of an inch at the summit, is covered entirely (stems and leaves) with masses of a fine reddish-purple tomentum. This may be called var. *obrutum*.

This moss differs from *An. compactum* in the short stems, longer, narrower leaves with the nerve longly excurrent, etc.

Dichodontium flavescens (Dicks.) has puzzled me for many years. This moss has, by nearly all bryologists, been regarded merely as a form of *D. pellucidum*. Hitherto I have been content to wait, inasmuch as I could not see any decided departure towards characters that were likely to give it sufficient distinction as well as permanency of type.

Last year near Onich I picked up what was at first sight reckoned an enlarged form of this moss, but when I saw that the leaves were much longer, more slender and more slenderly and sharply acuminate, that there was entire absence of papillæ, much larger areolation, and where, moreover, the nerve passed into the acute apex, and even in the larger proportion of cases was extended a little beyond it, I felt constrained to take a different view of this moss and to raise it to the rank of a species.

Dichodontium fulvescens, n.sp.—Usually in extended rather large straggling tufts, dark green, mixed with rusty brown above, darker below; stems slender, 2 to 3 inches long, simple or dichotomously, less frequently fastigiately branched above; leaves rather laxly disposed around the stem, slightly curled and twisted as well as spreading irregularly when dry, spreading much and even becoming arcuato-reflexed when moist, from an upright, broader slightly clasping base, lanceolate, acute at apex or slightly acuminate, margin plane, sharply and deeply serrated down

almost to the clasping base where the serratures are shallower, very generally one basal margin broadly inflexed, smooth not papillose; nerve strong, pale then reddish nearly throughout, latit. near base, .07-.1 mm., tapering and shortly excurrent, breadth near apex about .04 mm., serrated on back in upper third and often interruptedly winged or laminated, these downward serratures degenerating into nodules; cells at central base long with rounded extremities, generally narrow but distinct and separate, .06-.09 by .006-.011 mm., broader outwards and in five to seven rows at margin as the cells above, cells upwards gradually lessening into the upper, which are bluntly quadrate or bluntly oblong or merely oval, separate and distinct, .014-.022 mm. in long diameter. In the lower leaves the nerve at times scarcely reaches the bluntish serrated apex. Barren. On the ground near the sea and generally near the bases of wet rocks, Corran near Onich, September 1908.

This moss still bears slight evidences of its origin, but to drag it back, as some authors of the present day are still doing on account of these traces, is not scientific and certainly not in accordance with the modern trend of opinion.

ERRATUM.—Page 170, third line from foot, for “.2 ” read “2”.

ZOOLOGICAL NOTES.

Great Cormorant.—I lately shot a Great Cormorant in a loch near my house. A friend cut it open, and we found a kitten, eleven inches long, in the stomach. There were no signs of the kitten having been drowned before it was swallowed. It was certainly a strange thing to find in a Cormorant.—R. C. HALDANE.

White-throated Sparrow at the Flannan Islands.—On the 18th of May 1909 a male *Zonotrichia albicollis* was shot about noon, beside the lighthouse on Eilean Mor, Flannan Islands, and was sent to me in the flesh.—FRED. SMALLEY, Silverdale, Lancashire.

[This American species has occurred on several occasions in the British Islands (in Scotland in Aberdeenshire), but it has always been a moot point whether this, and other Nearctic Passeres, have not had an assisted passage from the New World. It may be pointed out, however, that it has a somewhat high northern range, since it is

found as far north as Labrador and the Fur countries, and thus it might reach our shores *via* Greenland and Iceland—not a phenomenal passage.—EDS.]

The Corn-Bunting and Chiff-Chaff in Mull.—While, relatively speaking, the Corn-Bunting (*Emberiza miliaria*) is a fairly common nesting species in the island of Iona, I have not been able to record it as such in Mull until this year, when it was fairly common, especially in the immediate neighbourhood of Tobermory. I shall be interested to note if the species remains during winter. Hitherto, I have only been able to describe it as a sporadic spring migrant.

The extension of the Chiff-Chaff (*Phylloscopus rufus*) to Mull is a limited one—one pair in 1908, and the same this year. The beech wood, near to Avos House, is the special habitat.—D. MACDONALD, Tobermory.

Heronries in Mull.—Mr. Boyd-Watt ought not to have asterisked Gribun heronry as being untenanted. From its unassailable position on the precipice, its occupancy is not likely to be endangered in the immediate future, and its past has extended for at least 100 years. Smaller heronries known to me are those near Avos House, Killiechronan, and Ulva.—D. MACDONALD, Tobermory.

Ruddy Sheld-Duck at Sule Skerry, Orkney.—An adult female specimen of the Ruddy Sheld-Duck (*Tadorna casarca*), was obtained on this Atlantic islet on the 18th of June, and was forwarded to the Royal Scottish Museum in the flesh. The occurrence of this southern and eastern European species at this remote skerry is very remarkable. It has not hitherto been known to visit any of the northern isles.—WM. EAGLE CLARKE.

Pintail in Solway: an explanation.—With reference to the note in the July number of the "Annals of Scottish Natural History," by Mr. Service, of the "Pintail" shot near Carsethorn on the Solway, Sir Richard Graham has kindly informed me that it was a Duck which came from Netherby.—JAS. BARTHOLOMEW, Beattock.

Occurrence of Black-tailed Godwit in the Cromarty Firth.—Beside the Cromarty Firth, on 23rd April 1909, I saw a Black-tailed Godwit (*Limosa belgica*) with a flock of Bar-tailed Godwits. The Black-tailed Godwit appeared to be in winter plumage. I afterwards saw the bird on 3rd and 21st May; and it was last seen on 4th June amongst a party of Knots. I again saw a bird of this species on 30th August, in company with some Bar-tailed Godwits.—ANNIE C. JACKSON, Swordale.

Black-tailed Godwit in Fife.—A Black-tailed Godwit (*Limosa belgica*), in interesting transition plumage, and the first I have ever seen here, was shot at the Morton Loch, Tentsmuir, by the owner, Mr. Christie, on the 20th of August, and sent to me. It is now in the Royal Scottish Museum.—W. BERRY, Newport, Fife.

An Adult Sabine's Gull at Lerwick, Shetland.—On the 25th of July, I saw a Gull the like of which I had never seen before. It was feeding in the park adjoining my house at Lerwick, when its peculiar plumage attracted my attention. The bird had a distinct black collar and a dark grey cap, and its tail was long and forked. Its size was about the same as that of a Black-headed Gull, and it was very graceful and active in its movements. I may be wrong, but I am fully persuaded from the descriptions of Sabine's Gull (*Xema sabini*), that the bird was an adult example of that species. My sister, who saw the bird at the same time, informs me that she observed it again a few days later.—JOHN S. TULLOCH, Lerwick.

Capture of the Sagre (*Spinax niger*) off the Shetlands.—Mr. Thomas Cook, fishmonger, Edinburgh, has presented to the collection of Fishes in the Royal Scottish Museum, a specimen of this rare shark in British waters. The example, which is about eighteen inches in length, was captured about twenty-five miles east of Shetland early in March. This species has hitherto only been obtained in the vicinity of the British Isles off the south-west coast of Ireland, where, Mr. E. W. L. Holt informs me, it is captured at depths from 100 to 400 fathoms in trawls and on long-lines.—WM. EAGLE CLARKE.

Spinous Shark (*Echinorhinus spinosus*) captured off the Isle of May.—A specimen of this uncommon fish in Scottish seas was captured in a trawl net fifteen miles east of the Isle of May on 16th July. The specimen was seven feet six inches long, and weighed one hundred and twelve pounds. I am indebted to Mr. Ross, fishmonger, Edinburgh, for these particulars, and for a sight of the fish.—WM. EAGLE CLARKE.

Cryptocephalus aureolus in Strathspey : a Beetle new to the Scottish Fauna.—I captured a specimen of this Beetle on the 8th of July on the golf course at Nethy Bridge. It was seated in the centre of a buttercup. I am assured by Dr. Sharp, F.R.S., who examined the specimen, and by other authorities, that this species has not hitherto been recorded from any locality north of the Tweed, though it is well known as an English insect.—ETHEL CLARE MAITLAND-DOUGALL, Scotsraig, Tayport.

Lepidoptera of the N.E. Highlands : a correction.—I am very anxious to correct two errors of identification which occurred in my "Notes on the Lepidoptera in the N.E. Highlands," in the April number of the "Annals," viz. *Ennychea octomaculata*, Fb., should be *Botys terrealis*, Tr., and *Sericoris urticana* Hb. should be *S. rivulana*. I am very sorry indeed to have made such a mistake. I had identified "*octomaculata*" by the larvæ, otherwise, of course, it would never have occurred.—DOROTHY J. JACKSON, Swordale, Ross-shire.

Hydrachnids (Water-mites) from the Forth Area.—In a recently published part of the "Proceedings" of the Royal Physical

Society" (vol. xvii. p. 42, footnote) I mentioned a number of *Hydrachnidæ* I had taken in the Forth Area. To these I would now add the following, the first four of which have not, so far as I know, been previously recorded from Scotland:—

Eulais georgei, Soar.—On 13th May 1908 I captured a number of immature examples of an *Eulais* in a pool on Gullane Links, which Mr. Soar considered were most likely nymphs of *E. georgei*. An adult obtained in the same pool on 28th May of the present year confirms his identification.

Gnaphiscus setosus, Koenike.—A male and several females of this species were taken at Crosswood Reservoir on the Pentlands, 31st July 1908. I have to thank Mr. Soar for their determination.

Unionicola (Atax) figuralis (C. L. Koch).—On 28th August last I got two males of this in a small loch on the Dunduff hills, near Dunfermline. I mistook them for another species, *U. crassipes* (Müll.), but Mr. Soar has pointed out to me the difference in the number of acetabula.

Arrhenurus cylindricus, Piersig.—Regarding six *Arrhenurus* ♀ ♀ from a pond at Drumshoreland, 13th June 1906, Mr. Halbert (*in lit.*) says: "There is little doubt these are the females of this species."

A. maculator (Müll.).—A ♀ from Loch Ard, 14th July 1906, is referred by Mr. Soar to this species.

Hydryphantes dispar (Schaub).—One from Loch Watson, near Doune, 22nd April 1905.

Piona rufa (C. L. Koch).—Burntisland Reservoir, common, 14th August 1908, and Gosford Ponds, 28th July 1909. Loch near Dunfermline, 28th August 1909.

P. circularis (Piers.).—♀, Kidlaw Reservoir, Haddingtonshire, 31st July 1909.

P. uncatata (Koen.).—♂, Kidlaw Reservoir, 31st July 1909.

I have now a list of sixty-two Hydrachnids from this area.—WILLIAM EVANS, Edinburgh.

Argyroneta aquatica, Latr., in Perthshire.—Several examples of this interesting spider were captured on Saturday, 4th September, while netting a weedy pool on Methven Moss. The species does not seem to have been observed in Perthshire before.—ALEX. M. RODGER, Museum, Perth.

Two New British Diptera.—It is with pleasure that I record the following additions to the list of British Diptera, both due to the energy and enthusiasm of my friend, the Rev. James Waterston. In July last he brought to me for identification a series of specimens belonging to the genus *Spilogaster* which he could not satisfactorily refer to any species in Meade's "Descriptive List." With the aid of Stein's 'Analytische Uebersicht,' published in the "Entomologische

Nachrichten," Jahrg. xix. (1893), I have succeeded in satisfying myself that the specimens are *platyptera*, Ztt., first described in the "Diptera Scandinaviæ," tom. viii. p. 3281. This species is distinguished by its entirely black legs, indistinctly three-striped thorax, bristly hind tibiæ (three rows of setæ along the whole length), and broad wings. These interesting specimens were reared from larvæ taken at Gorebridge, Midlothian.

The second species concerned is *Scatella stenhammari*, Ztt., taken by Mr. Waterston on the window of a house in Edinburgh. I have examined this fly very carefully, and although the wings are not *quite* like Becker's figure in the Berl. Ent. Zeitschrift for 1896, yet the description fits fairly well, and the fly cannot well be anything else.—PERCY H. GRIMSHAW, Edinburgh.

BOTANICAL NOTES AND NEWS.

Additional Vice-county Records from West of Scotland.—During a few days spent in the latter part of August in a visit to the west of Scotland I met with the following, not previously recorded from the respective vice-counties :—

Barbarea vulgaris, R. Br.—One weak plant by a road in Tobermory (Mid Ebudes, 103), perhaps a casual.

Cnicus arvensis, Hoffm., var. *setosus* (Bess.).—Several examples on the shore close to a boat-wharf, near Ballachulish Pier (Argyll, 98). This form in recent years has occurred in several places in the vicinity of Aberdeen, and appears to be becoming more common, but always under conditions that suggest an alien origin. It is probably not native in Scotland.

Atriplex Babingtonii, Woods, var. *virescens*, Lange.—On the beach near Stornoway (Hebrides, 110).

Rumex crispus × *obtusifolius* (*acutus*, L.).—Near Oban (Argyll, 98).—JAMES W. H. TRAIL.

Synechitrium aureum, *Schroet.*, near Aberdeen.—Near the end of June 1909 I found this fungus in abundance on Wild Thyme (*Thymus Serpyllum*), on rather poor soil covering an old bed of shingle on the north bank of the river Dee at Murtle, a few miles west of Aberdeen. Though of frequent occurrence, on a great variety of host-plants, in various countries of Europe and of North America, I am not aware that it had been previously observed in Scotland. It produces very characteristic effects on the stems and leaves, which become thickened, and are more or less covered with the small warty dull-red galls of the parasite.—JAMES W. H. TRAIL.

Study of British Roses.—A paper on the ‘Collection and Identification of British Roses,’ by Rev. A. Ley and Major A. H. Wolley-Dod, in the “Journal of Botany,” July 1909, will be found helpful to students of the British flora, and should enable its readers to secure good material for the recognition of the forms. To appreciate the assistance it affords, the paper requires to be carefully studied; but the authors briefly enumerate at its close the relative importance of the several features helpful in determining the various types of roses. These features are :—

	Of primary importance. Habit.	Of secondary importance. Colour of stem and foliage.
Stems	Direction.	
Prickles	(Size and shape).	Number.
Leaflets	Serration and clothing.	Number (size and shape).
Petioles . . . .	...	Clothing.
Stipules and bracts . . . .	...	Form and clothing.
Peduncles	Length and clothing.	Number.
Sepals	Direction and duration.	Pinnation and clothing.
Styles	Cohesion and hairiness.	
Disc	(Shape).	
Fruit	Time of ripening, shape and size.	Colour.

Characters inclosed in brackets might be placed under either *primary* or *secondary*, according to the group or sub-section to which the species under consideration belongs.

British Species of Taraxacum.—In the “Monographie der Gattung Taraxacum,” published in 1907, by Dr. H. v. Handel-Mazzetti, the forms seen by him from the British Islands are named as below :—

1. *T. paludosum*, Lightf. [*T. officinale*, var. *palustre* (Sm.) of Babington’s “Manual”]. Europe (except almost all Russia) as far north as Upsala, also Asia from Thibet and North China to Trans-Baikal Siberia and in Persia.
2. Intermediates between *T. paludosum* and *T. vulgare* [*T. officinale*, var. *udum* (Jord.), of Bab. “Man.”]. Europe and Western Asia to N. India and Turkestan. “Anglia et Scotia; e locis usque ad ins. Shetland dispersis.”
3. *T. vulgare*, Lam. [*T. officinale*, var. *a* of Bab. “Man.”]. Europe and Asia, except in arctic zone: introduced by man into all parts of the world. “Anglia et Scotia, e locis dispersis.”
4. *T. lævigatum* (Wild.), DC. [*T. officinale*, var. *erythrospermum*, of Bab. “Man.”]. Warmer places in Europe (except in north), in Western Asia, and in Atlantic region of N. Africa; introduced by man elsewhere, e.g. into N. America, “Edinburgh, Ayr,” and numerous localities in England.

5. *T. obliquum* (Fr.), Dahlst. [*T. officinale*, var. *lævigatum*, of Bab. "Man."].—This has almost the same distribution as *T. lævigatum*, from which it can be distinguished with certainty by its ripe fruit being pale greyish-brown instead of deep reddish-purple, or almost purple-black. "Near Arbroath," and from England also.

The author expresses the view that the numerous forms named and described by Dahlstedt and Raunkjær in recent years are not of specific value.

Forms of *Senecio vulgaris*.—Dr. A. H. Trow has studied these in the vicinity of Cardiff, and has tested their length of life and constancy when cultivated, and the results when they are crossed. In his "Flora of Glamorgan" (part iii. pp. 91-93), quoted in the "Journal of Botany," 1909, pp. 304-306, he names four varieties and distinguishes them as:—

1. *præcox*, requiring from date of sowing to ripening of seed a shorter period (72 days); stem while young rather zigzag, with a few very long internodes; main axis soon overtopped and displaced by a lateral branch; leaves nearly plane, not deeply pinnatifid; capitula small and slender.
2. *erectus*, requiring longer time (83 days); stem straight and erect, internodes many, rather short and stout; leaves deeply pinnatifid or pinnatisect, strikingly pectinate when half developed, yellow-green, capitula of medium size, not radiate.
3. *erectus*, var. *radiatus*, differs from *erectus* only in having 8 to 13 ray-florets in each capitulum, sometimes very long and revolute.
4. *multicaulis*, requiring longer time (90 days); basal internodes short, hence a rosette of basal leaves; dark-green leaves resembling those of *erectus* but longer; stems numerous, with upper internodes long, rendering inflorescence less compact, with capitula nearly erect, bracts long; capitula large, broad and rather short; disc florets soft yellow, browning after pollination; cotyledons of seedlings large.

Experiments in growing and crossing these forms, carried on since 1905, show that they remain constant when grown side by side if not crossed, and that when crossed they follow the Mendelian law.

The prize offered by the Edinburgh University to students in the classes of Botany for the best Herbarium of British Mosses and Hepatics (not less than 400 species and varieties correctly named), collected between May 1908 and June 1909, has been awarded to Mr. W. Edgar Evans, B.Sc., an occasional contributor to our pages. The specimens were collected entirely in the Edinburgh district and central Perthshire.

CURRENT LITERATURE.

The Titles and Purport of Papers and Notes relating to Scottish Natural History which have appeared during the Quarter—July-September 1909.

[The Editors desire assistance to enable them to make this Section as complete as possible. Contributions on the lines indicated will be most acceptable, and will bear the initials of the Contributor. The Editors will have access to the sources of information undermentioned.]

ZOOLOGY.

THE ORIGIN OF HIGHLAND CATTLE. R. L. *The Field*, July 3, 1909, p. 45. Criticising a paper by Prof. James Wilson in the Scientific Proceedings of the Royal Dublin Society.

ANTLERS OF SCOTTISH RED DEER. J. G. Millais. *The Field*, July 10, 1909, p. 93. A letter to the Editor, claiming that a specimen found in the river Halladale is superior to one found at Kintail, and said to be "the largest known red deer's horn from Scotland."

ANTLERS OF SCOTTISH RED DEER. Further letters on this subject are printed in *The Field*, July 17, 1909, p. 144, from Henry Laver, "A. R.," and William Ross, and on July 24, p. 194, from Wm. Stirling.

RED-BREASTED FLYCATCHER IN FIFESHIRE. W. S. *The Field*, July 10, 1909, p. 94. A pair reported to have been seen from June 20 to 24. Letter by "Hy. S." in issue of July 17 stating the birds to be Spotted Flycatchers.

OUR PRESENT KNOWLEDGE OF THE FAUNA OF THE FORTH AREA. William Evans, F.F.A., F.R.S.E. *Proc. Roy. Phys. Soc. Edin.*, vol. xvii. pp. 1-64 d. This paper forms the Presidential Address for the Session 1906-1907, and gives a useful summary of the species recorded for the area in all groups. The total recorded in print or in the author's MS. lists is 6865.

ON NEW AND RARE CRUSTACEA FROM SCOTTISH WATERS. Thomas Scott, LL.D., F.L.S. *Ann. and Mag. Nat. Hist.*, July 1909, pp. 31-36, pts. ii. and iii. Four species recorded, of which two (an Amphipod and a Copepod) are described as new to science.

SOME NOTES ON THE LEPIDOPTERA OF THE "DALE COLLECTION" OF BRITISH INSECTS, NOW IN THE OXFORD UNIVERSITY MUSEUM. James J. Walker, M.A., R.N., F.L.S. *Ent. Mo. Mag.* August 1909, pp. 175-181. Several Scottish records are given.

LIST OF LEPIDOPTERA CAPTURED RECENTLY IN ROSS-SHIRE (concluded). Dorothy J. Jackson. *Ent. Record*, July 15 and

September 15, 1909, pp. 176-181 and 212-216. Records a large number of Noctuides, Geometrides, Pyralides, Alucitides, Orneodides, Crambides, Tortricides, and Tineina.

SELIDOSEMA ERICETARIA IN SCOTLAND. G. S. A. Baynes. *Entomologist*, September 1909, p. 235. Two males taken near Mallaig, Inverness-shire.

FURTHER VARIATION IN NYSSIA LAPPONARIA. E. A. Cockayne. *Entomologist*, July 1909, pp. 169-170, pl. v. Describes and figures specimens taken in the Rannoch district.

NOTES ON THE LIFE-HISTORY OF OLETHREUTES (SERICORIS) BIFASCIANA, HER. Eustace R. Bankes, M.A., F.E.S. *Ent. Mo. Mag.*, September 1909, pp. 198-201. Recorded from Aviemore.

ANTHRAX PANISCUS, ROSSI, IN SCOTLAND. William Evans. *Ent. Mo. Mag.*, July 1909, p. 166. Several localities for this species in the Forth district are given.

PANCHLORA NIVEA, L. Henry H. Brown. *Entomologist*, July 1909, p. 186. A specimen brought to Cupar, Fife, with bananas from Jamaica.

SOME MEDUSÆ AND CTENOPHORES FROM THE FIRTH OF FORTH. Wm. Evans, F.R.S.E., and J. H. Ashworth, D.Sc. *Proc. Roy. Phys. Soc. Edin.*, vol. xvii. No. 6 (1909), pp. 300-311. Thirteen species recorded.

BOTANY.

SOME SUTHERLAND PLANTS. By Rev. E. S. Marshall, F.L.S., and W. A. Shoolbred, F.L.S. (*Journ. Bot.* 1909, pp. 220-223). Several new records for both East and West Sutherland (107, 108), especially in the genus *Hieracium*.

THE COLLECTION AND IDENTIFICATION OF ROSES. By Rev. A. Ley, M.A., and Major A. H. Wolley-Dod (*Journ. Bot.* 1909, pp. 247-255). An important paper.

CAREX CANESCENS, L. By G. Claridge Druce, M.A., F.L.S. (*Journ. Bot.* 1909, pp. 301-304), gives reasons for regarding this as equivalent to *C. curta*, Good., and not to *C. divulsa*, which is under *C. canescens* in the Linnæus herbarium.

FORMS OF SENECIO VULGARIS, L. By A. H. Trow, D.Sc., F.L.S. (*Journ. Bot.* 1909, pp. 304-306, extracted from his *Flora of Glamorgan*, part iii., pp. 91-93), describes four forms found near Cardiff.

SUPPLEMENTARY RECORDS OF BRITISH RUBI. By Rev. W. Moyle Rogers, F.L.S. (*Journ. Bot.* 1909, pp. 310-318).

COMITAL CENSUS NUMBERS. By G. Claridge Druce, M.A., F.L.S. (*Journ. Bot.* 1909, pp. 318-320).

ORCHIS ERICETORUM, LINT. = O. MACULATA PRÆCOX, WEBSTER. By G. Claridge Druce (*Journ. Bot.* 1909, pp. 322-323).

BOOK NOTICES.

THE BRITISH WARBLERS: A HISTORY, WITH PROBLEMS OF THEIR LIVES. By Eliot Howard, F.Z.S., M.B.O.U. London: R. H. Porter. Parts II. and III. Price 21s. net each.

In the "Annals" for 1907 (p. 191) we welcomed the appearance of Part I. of this important and beautiful work: important on account of the originality of the greater part of its letterpress, and beautiful with respect to the excellence and wealth of its illustrations. Parts II. and III. have since been issued, and these fully sustain the high standard of merit foreshadowed by the initial number.

It is a long time since anything so largely original has been written regarding the histories of any British birds. It is abundantly evident to those who have read these singularly interesting accounts of the more or less obscure habits of the various species of Warblers treated of, that Mr. Howard knows more about them than any other British ornithologist who has written on the subject. Some may be inclined to doubt certain of the author's deductions as to the motives of the particular actions he describes so well, but we must accept with more than ordinary respect the opinions of one who has made this subject his own, and who has laboured so long and to such good purpose. The species dealt with in the parts under notice, are the Blackcap, Radde's Bush Warbler, Pallas's Willow Warbler, Chiff-chaff, and Yellow-browed Warbler. The illustrations comprise nine in colours and fifteen in photogravure, while four maps are given showing seasonal distribution. Like the letterpress the photogravure pictures (which are from the original sketches made by Mr. Howard) are highly original, and portray the birds in attitudes in which they have not hitherto been depicted.

A TOURIST'S FLORA OF THE WEST OF IRELAND. By Robert Lloyd Praeger. 8vo, pp. xii. 243, pls. 27. (Dublin: Hodges, Figgis, and Co.) Price 3s. 6d.

This must commend itself to everyone interested in the flora of the British Islands as an excellent book, containing a very large amount of information in small bulk, and remarkably clear in its exposition. The area dealt with is chiefly Ireland west of the Shannon, but takes in also the districts of Limerick and Enniskillen, thus including in its flora a number of species found elsewhere

as characteristic of South-western Europe or of Eastern North America.

A short "introduction" is devoted to a general physical description of the district, its rocks and soils, its climate, its vegetational subdivisions, its plant formations and natural growths, the character of the flora, and an outline of the progress of botanical investigation locally. This is followed by a "Topographical Section," in which each county is considered separately, the more interesting places or more convenient tourist-centres being chiefly described, and their most noteworthy plants enumerated, and references added to published sources of fuller information. Tourists will appreciate the information regarding the means of access and centres to work from and where one may reside; while the derivations and meanings of the place-names, and the brief references to past history add to the value and interest of the work.

The "Systematic Section" extends to 107 pages. In it the distribution is indicated under each species, localities being given only where the species is limited in its range, and notes being added with regard to peculiarities of distribution, while the relations to nature of soil and to man's influence are also stated. The arrangement and nomenclature "are almost without exception those employed in 'Cybele hibernica' and 'Irish Topographical Botany,'" the names in use in the "London Catalogue," ed. 10, being added where they differ from those used by the author.

A number of photographs illustrating the characteristic scenery, rock-formations and plants, sketch-maps and other illustrations in the text, and five coloured maps of the west of Ireland, reduced from ordnance surveys, and showing the orographical and petrographical features of the country, add to the value and usefulness of the book, which will be indispensable not only to botanical tourists in its area but to all botanists interested in the distribution of plants, and more especially in the British flora.

Good indexes to the several sections render access to the information it contains easy.

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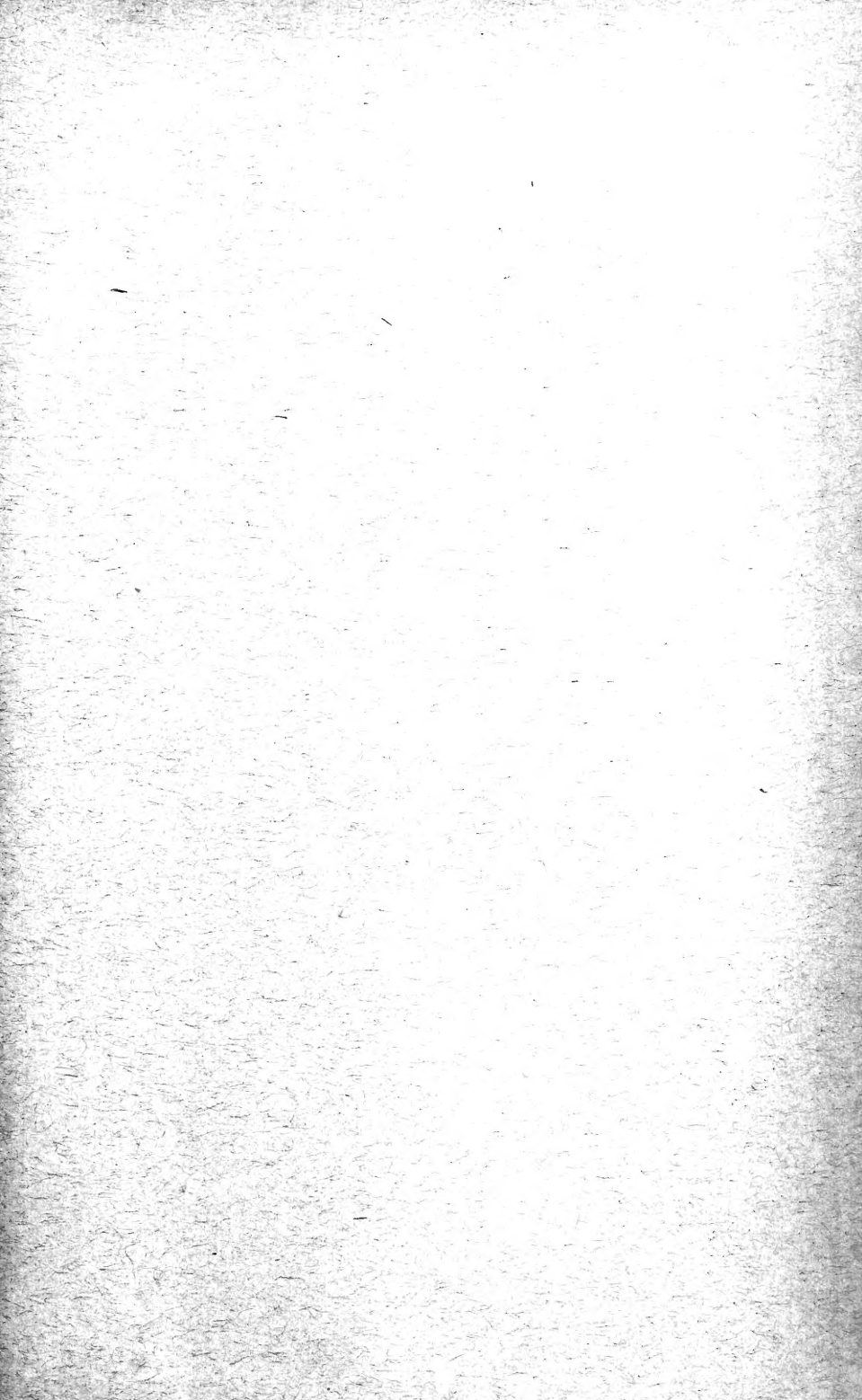
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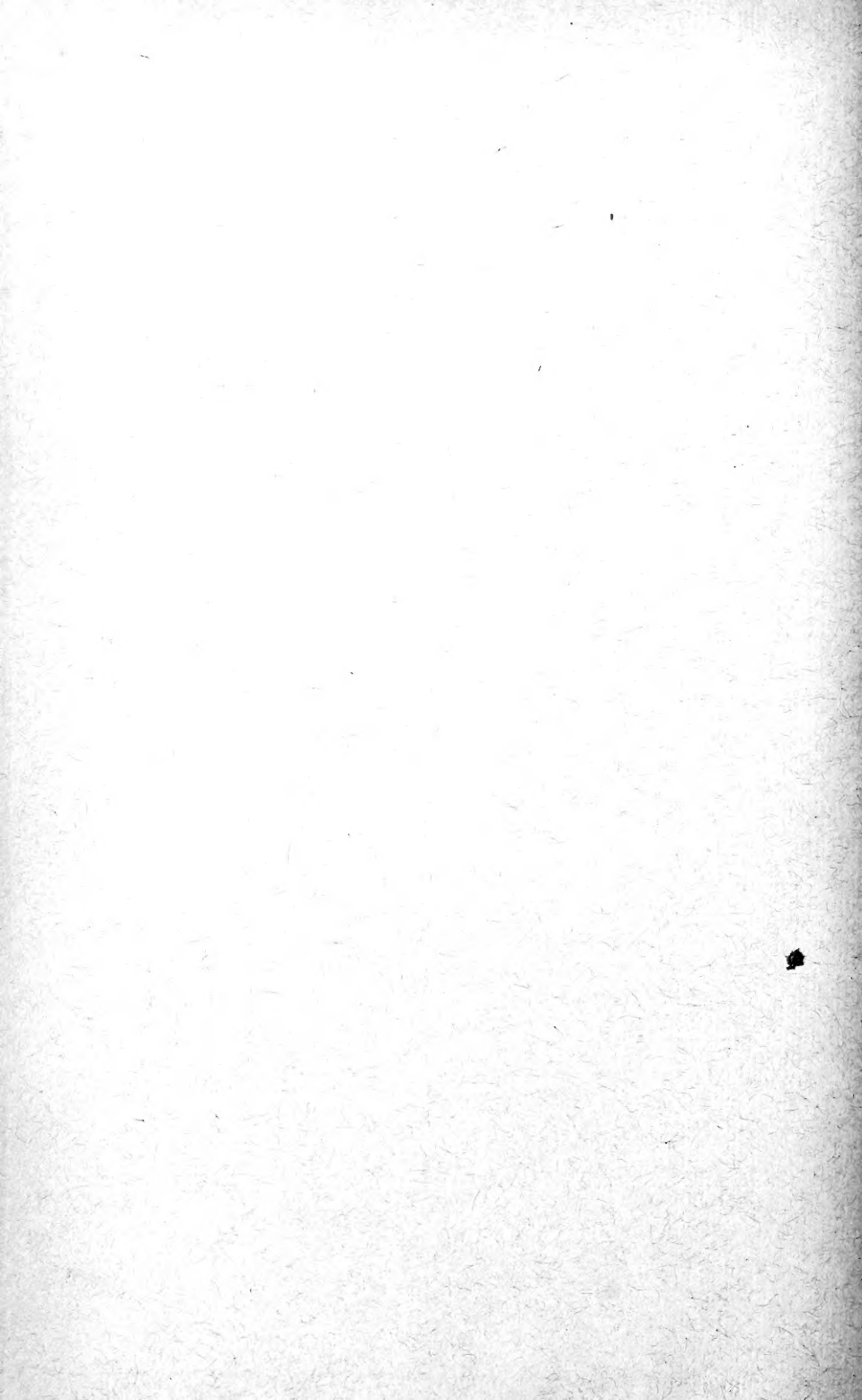
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